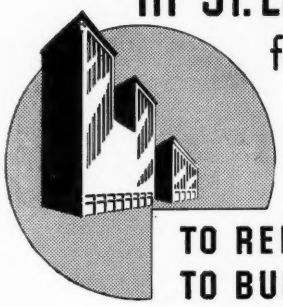

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CONTENTS FOR NOVEMBER, 1933

Original Articles

Time for Corrective Orthodontic Treatment. Charles R. Baker, D.D.S., F.A.C.D., Evanston, Ill. ---------- 1089

Meeting a Few of the Technical and Clinical Difficulties Involved in Orthodontia. Ernest N. Bach, A.B., D.D.S., Toledo, Ohio---------- 1097

Growth of the Face and Occlusion of the Teeth in Relation to Orthodontic Treatment. Milo Hellman, D.D.S., Sc.D., New York, N. Y. ---------- 1116

A Compromise Treatment With the Extraction of the Permanent Second Molars. Raymond L. Webster, D.M.D., Providence, R. I. ---------- 1148

Carcinoma of the Jaws. Conrad C. Gilkison, D.D.S., Cleveland, Ohio-------- 1153

Department of Dentistry for Children

To the Members of the American Society for the Promotion of Dentistry for Children. Haidee Weeks, D.D.S., New Orleans, La. ---------- 1161

(*Continued on page* 8)

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CONTENTS FOR NOVEMBER, 1933

(Continued from page 7)

Committee Reports Given at the Seventh Annual Meeting of the American Society for the Promotion of Dentistry for Children ---- 1163

Minutes of the Seventh Annual Meeting of the American Society for the Promotion of Dentistry for Children ---- 1176

Abstracts of Current Literature

Nutrition and Pediatrics ---- 1193

Editorial

A Syndicated Article ---- 1196

News and Notes

News and Notes ---- 1199

The International Journal of
Orthodontia and Dentistry
for Children

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VOL. XIX ST. LOUIS, NOVEMBER, 1933 NO. 11

ORIGINAL ARTICLES

TIME FOR CORRECTIVE ORTHODONTIC TREATMENT*

CHARLES R. BAKER, D.D.S., F.A.C.D., EVANSTON, ILL.

LOGICALLY, orthodontic treatment should be classified as *preventive treatment, corrective treatment* and *posttreatment.*

Based principally on clinical experience, my ideas concerning the time to begin corrective orthodontic treatment are essentially the same as expressed in previous papers on this subject.

In considering the time to begin corrective orthodontic treatment, a careful study should be made of the history of the case, particularly in regard to the factor of abnormal bone growth, for our work involves the movement of the roots of teeth surrounded by bone. If the normal development of healthy bone is being interfered with, as may be indicated in some cases by weak arches of the feet or by an abnormal spinal curvature, it is probable that normal bone changes and physiologic development will not take place in the jaws, and that the ultimate success of orthodontic treatment will not be as complete as desired in the matter of tooth positions and arch relationship.

Full mouth radiograms should be used in every case, for these may indicate that certain teeth are missing or that supernumerary teeth or other abnormal growths are present. The length of the roots of deciduous teeth and the degree of development of the permanent teeth should also be noted. These factors are important in a decision as to the correct time to apply treatment.

The number of deciduous and permanent teeth present, the positions of the teeth in each arch and the relationship of the dental arches must, of course, be carefully considered, as well as other causative factors, including injurious habits.

*Read before the New York Society of Orthodontists, New York City, November 14, 1932.

The age of the patient in years and months is not of particular importance, for two children of different ages may have essentially the same amount and type of abnormal development of the face and jaws and the same type and degree of malocclusion of the teeth. The loss of deciduous teeth and the eruption of permanent teeth are by no means uniform as to age; in fact, this process is extremely variable. The eruption of permanent mandibular canines is often noted as early as the age of nine years, and I have seen pre-

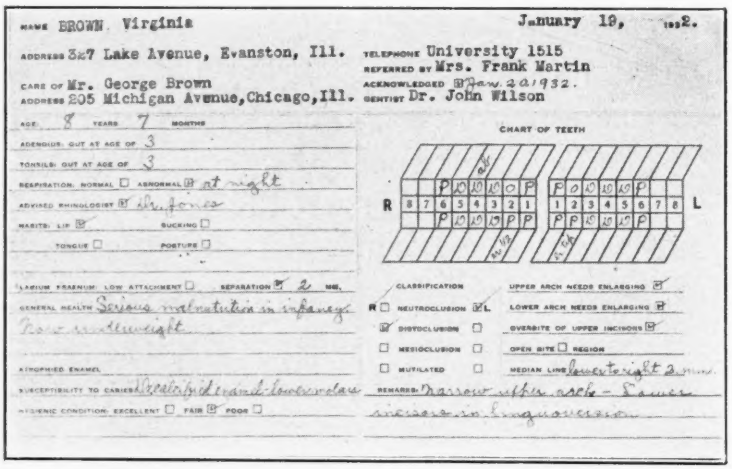

NAME BROWN Virginia January 19, 1932.
ADDRESS 347 Lake Avenue, Evanston, Ill. TELEPHONE University 1515
CARE OF Mr. George Brown REFERRED BY Mrs. Frank Martin
ADDRESS 205 Michigan Avenue, Chicago, Ill. ACKNOWLEDGED Jan. 20/1932.
DENTIST Dr. John Wilson
AGE 8 YEARS 7 MONTHS
ADENOIDS OUT AT AGE OF 3
TONSILS OUT AT AGE OF 3
RESPIRATION: NORMAL ☐ ABNORMAL ☑ at night
ADVISED RHINOLOGIST ☑ Dr. Jones
HABITS: LIP ☑ SUCKING ☐
TONGUE ☐ POSTURE ☐
LABIUM FRAENUM: LOW ATTACHMENT ☐ SEPARATION ☑ 2 MM.
GENERAL HEALTH Serious malnutrition in infancy
Poor underweight
ATROPHIED ENAMEL
SUSCEPTIBILITY TO CARIES Moderately prevalent lower molars
HYGIENIC CONDITION: EXCELLENT ☐ FAIR ☑ POOR ☐
CHART OF TEETH
CLASSIFICATION
R ☐ NEUTROCLUSION ☑ L
☑ DISTOCLUSION ☐
☐ MESIOCLUSION ☐
☐ MUTILATED ☐
UPPER ARCH NEEDS ENLARGING ☑
LOWER ARCH NEEDS ENLARGING ☑
OVERBITE OF UPPER INCISORS ☑
OPEN BITE ☐ REGION
MEDIAN LINE lower right 2 mm.
REMARKS: Narrow upper arch - Lower incisors in labioversion

Fig. 1.

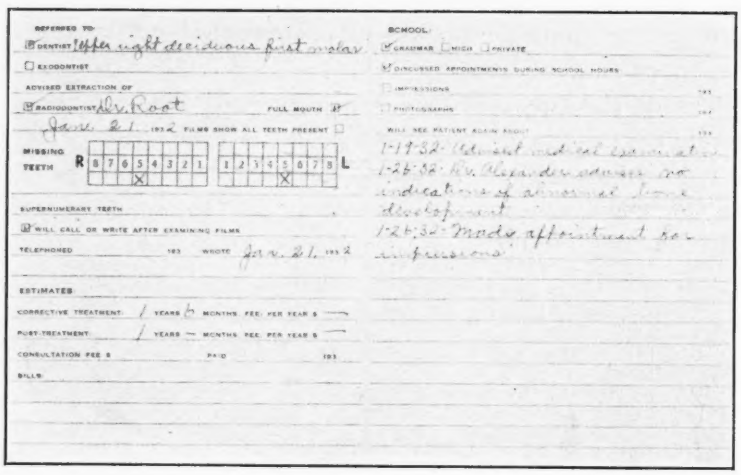

REFERRED TO:
☑ DENTIST Upper right deciduous first molar
☐ EXODONTIST
ADVISED EXTRACTION OF
☑ RADIODONTIST Dr. Root FULL MOUTH ☑
Jan. 21 1932 FILMS SHOW ALL TEETH PRESENT ☐
MISSING TEETH R 8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8 L
SUPERNUMERARY TEETH
☑ WILL CALL OR WRITE AFTER EXAMINING FILMS
TELEPHONED 193 WROTE Jan. 21, 1932
ESTIMATES
CORRECTIVE TREATMENT / YEARS 6 MONTHS FEE PER YEAR $
POST-TREATMENT / YEARS — MONTHS FEE PER YEAR $
CONSULTATION FEE $ PAID 193
BILLS
SCHOOL
☑ GRAMMAR ☐ HIGH ☐ PRIVATE
☑ DISCUSSED APPOINTMENTS DURING SCHOOL HOURS
☐ IMPRESSIONS 193
☐ PHOTOGRAPHS 193
WILL SEE PATIENT AGAIN ABOUT 193
1-19-32 Clinical and rad. examination
1-26-32 Rad. Clear, no advance indications of abnormal tooth development
1-26-32 Made appointment for impressions

Fig. 2.

molars in the dental arches at eight years. In other cases, deciduous teeth remain in the arches many years after the customary time for their loss.

I believe that the term "early treatment" has been misapplied and misunderstood on many occasions. Obviously if a permanent second molar erupts in malocclusion, early treatment would mean treatment as soon as practicable after the deformity was recognized. The average time for this tooth to erupt is at the age of twelve years, yet this would be early treatment for this particular case.

The examination card (Figs. 1 and 2) will show what information I endeavor to obtain regarding the history of each patient, which information is used as an aid in determining the correct time for treatment. Impressions are taken and models made in cases which are mutilated by the loss of teeth, or which have other unusual features requiring more deliberate consideration. The examination card, models and full mouth radiograms, together with a study of the face, are used in the analysis of a case and in planning the treatment.

I agree with the generally accepted rule that we should endeavor to produce conditions of occlusion and function and to encourage developments that will be normal for the individual patient at his specific age (meaning stage of development), for I believe that by so doing we are giving nature an opportunity to continue normal development.

Fig. 3.

Many cases come to the orthodontist at a time when abnormal development has progressed to such an extent that it is too late to apply corrective orthodontic treatment at the best time for those cases.

Injurious habits should be broken as soon as possible. In some cases appliances are indicated which will mechanically interfere with the practice of sucking and tongue pressure habits. These may be applied in cases of very young patients.

I am firmly of the opinion that the deciduous dental arches should receive corrective orthodontic treatment in cases where there is abnormal arch form in a marked degree (Fig. 3), in cases where there is an abnormal antero-posterior arch relationship (Fig. 4), in cases of a cross-bite (Fig. 5), in cases where there is a lack of occlusion of the posterior teeth (Fig. 6), and in cases of open-bite.

We cannot expect the permanent first molars to erupt and occlude normally at a time when the deciduous molars are in abnormal positions and relationship.

In order to gain the maximum benefit in such cases, the treatment should be applied at a time when the roots of the deciduous teeth are fully developed and no absorption of them has occurred, for at this time there is a minimum of development of the permanent teeth.

Although we do not know that the permanent teeth will erupt in normal positions as a result of the correction of malocclusion of the deciduous arches,

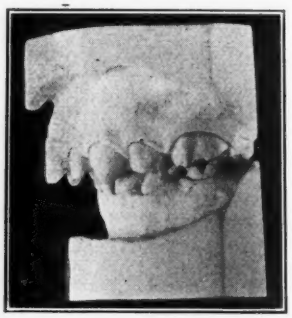


Fig. 4.

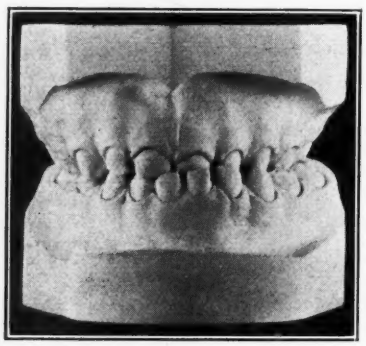


Fig. 5.

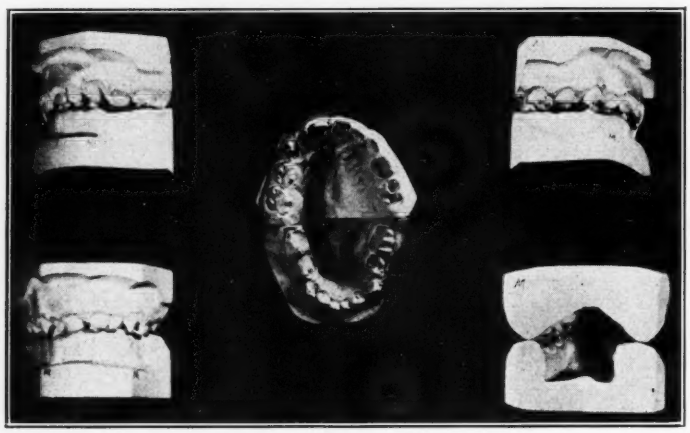


Fig. 6.

we do know that abnormal occlusal interference has been eliminated, that normal function, which is generally considered so important in the development of the lower half of the face, has been restored, and that the opportunity for subsequent normal development has been improved.

During the progress of absorption of the deciduous incisor roots and the coincident development of their permanent successors, radiograms should be carefully studied in the consideration of orthodontic movement of the deciduous incisors. It is obvious that orthodontic treatment in cases where there is considerable absorption of the deciduous incisor roots, and consequently a greater development of the permanent incisors, will have little, if any, corrective influence on the latter.

However, during this period, corrective treatment may be applied to the deciduous molars and canines and the permanent first molars, if these have erupted, and the arches may be widened, the anteroposterior relationship may be corrected and other adjustments may be made. In fact, in my opinion, this is the correct time for such treatment.

The time of eruption of the permanent incisors is a particularly good time for the treatment of mandibular incisors in torsiversion, or for widening the mandibular dental arch if necessary (Fig. 7). If there is a condition of anteroclusion or posteroclusion present, together with crowded mandibular incisors, I usually prefer to place the mandibular incisors in normal positions by a development of the mandibular arch previous to correcting the anteroposterior relationship of the posterior teeth.

Fig. 7.

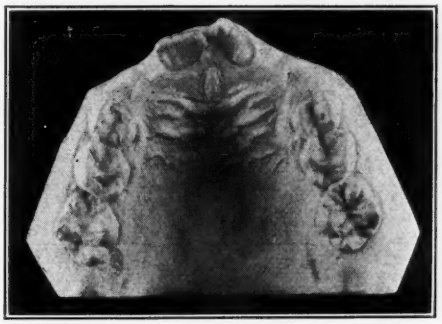


Fig. 8.

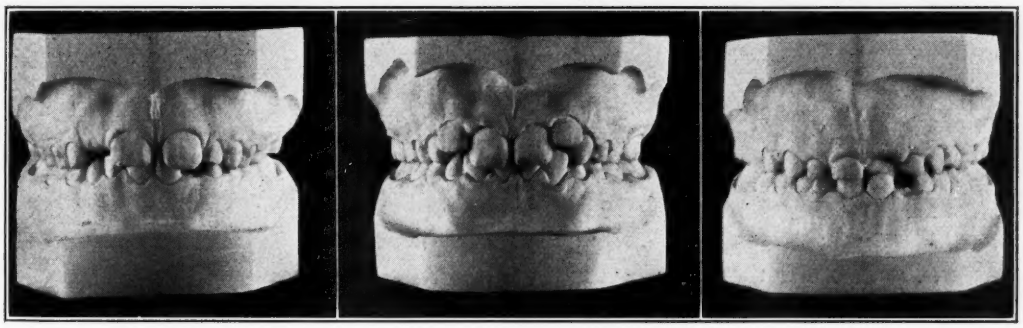


Fig. 9. Fig. 10. Fig. 11.

If the maxillary central incisors erupt in torsiversion (Fig. 8), I believe that treatment and retention of these teeth should be promptly applied, before the lateral incisors erupt. If the maxillary central incisors erupt with considerable space between them, and they are not in torsiversion (Fig. 9), I believe that in most cases this malocclusion should be corrected prior to the eruption of the lateral incisors, unless it seems probable that the eruption of the lateral incisors will correct the condition.

If the maxillary lateral incisors erupt in torsiversion (Fig. 10), I am in favor of treatment as soon as practicable. This treatment may involve the widening of the maxillary arch, particularly in the deciduous molar region, in order to facilitate the rotation of the lateral incisors and also to relieve the crowded condition in the region of the rapidly developing permanent canines.

In cases where any of the maxillary incisors erupt lingually to the mandibular teeth, and in cases where any of the mandibular incisors erupt labially to the maxillary teeth (Fig. 11), immediate treatment should be applied, during the eruption of these teeth if possible, in order to correct the deformity and to prevent the development of a more serious state of malocclusion.

This period of rapid development which has just been considered, namely, beginning at the completion of the deciduous dentition and continuing to the time when the permanent first molars and incisors have taken their places in the dental arches, is, in my opinion, the most advantageous time for corrective orthodontic treatment as outlined, which mechanical treatment may have been supplemented by the elimination of injurious habits and by corrective muscular exercises. If the deciduous teeth have been placed in normal arrangement and occlusion prior to the eruption of the permanent first molars, and if the permanent incisors have been placed in normal occlusion, we may confidently anticipate that, in the majority of cases, the subsequent development of the dental arches may be normal. Such normal development

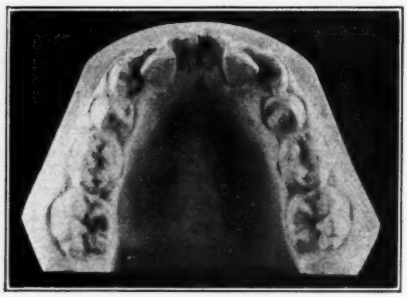


Fig. 12.

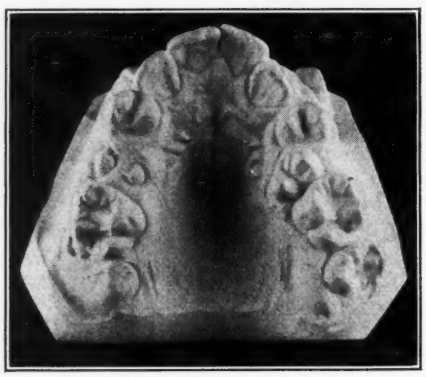


Fig. 13.

may be interfered with by etiologic factors which may be present or which may occur later, but at least we have followed the rule previously mentioned in producing what may be considered a normal development for the patient at his specific age, and have eliminated conditions, the presence of which might have contributed to a more serious condition of malocclusion.

The next important developmental change is the exchange of the deciduous molars for premolars. This exchange must be in harmony with nature's plan, the important factor being that corresponding maxillary and mandibular deciduous molars should be exfoliated or removed from the arches at approximately the same time.

At the time when deciduous molars are being lost, cases frequently offer perplexing problems to the orthodontist. The malocclusion may be of a complex character, including abnormal tooth positions, abnormal arch form and abnormal anteroposterior arch relationship. Obviously, it is impossible to suggest any general rules to be followed in these cases.

In a case where a deciduous molar has recently been lost and the smaller premolar is erupting, I believe that it is generally good judgment to await

the natural forward movement of the posterior teeth to make proper proximal contacts in this area rather than to use an appliance for the purpose.

In cases requiring a widening of the dental arch in which the first premolars have recently erupted (Fig. 12), I would apply orthodontic pressure for this purpose as soon as practicable, although there may be considerable absorption of the roots of the deciduous second molars, for experience has proved that in many cases of this kind the second premolars also receive favorable influence.

Prompt treatment is indicated in the case of premolars erupting in malocclusion (Fig. 13), before there is occlusal contact of these teeth and before the complete development of their roots.

Steps should be taken to provide sufficient room in the arches for the eruption of the permanent canines. Usually lower canines seem to erupt in normal positions if the deciduous canines have not been prematurely lost. The eruption of the maxillary canines is sometimes a much slower process. Even if there is sufficient space in the arch, and if radiograms indicate that these teeth are not abnormally crowded, in some cases it is a matter of many months after the loss of the deciduous maxillary canines before their eruption is complete. If the maxillary canines fail to erupt, I believe that prompt treatment is advisable. If treatment is delayed too long, pressure may occur which will cause absorption of tooth roots, and the more mature development of the investing tissues may interfere with the progress of tooth movement.

Second molars occasionally erupt in malocclusion and should receive treatment as soon as they have erupted sufficiently to allow the application of orthodontic pressure.

While the foregoing statements are not intended to cover completely the subject assigned to me, I have attempted to place before you a number of points which, in my opinion, are of fundamental importance.

I am entirely in accord with the ideas of Dr. R. C. Willett concerning the use of space maintaining appliances where their use is indicated.

In a case of deep overbite of the maxillary anterior teeth, I usually begin treatment with the use of a vulcanite bite plate so arranged that there is incisal contact of the mandibular anterior teeth and the bite of the posterior teeth is kept open. It is interesting to note the rapid vertical development in the region of the posterior teeth in many of these cases. After this vertical development has occurred, I use other appliances for whatever additional treatment may be necessary.

In cases of missing permanent teeth, it is sometimes advisable to extract certain deciduous teeth. These cases should be carefully studied in order that the teeth may be removed at the very best time to encourage the desired development. If a permanent maxillary lateral incisor is missing, it is my usual practice to extract the deciduous lateral incisor and canine in order to encourage the forward drift of the permanent canine so that it may take a position next to the central incisor. I realize that this method does not meet with the approval of many operators, but I have never seen what might be considered an entirely satisfactory result in cases of this kind where the space was maintained and an artificial substitute was used.

I believe that it is sound judgment to apply corrective treatment to teeth before their root development is completed.

The conscientious practice of certain muscular exercises is often a valuable aid during corrective and postorthodontic treatment. In posteroclusion cases associated with protruding maxillary incisors, I do not feel that lip exercises are of any particular value until the anteroposterior arch relationship is practically normal.

I frequently advise the use of cold cream on the lower lips of patients who have the lip-biting habit, just to remind them not to wet and bite the lips.

In cases of mouth-breathing not complicated by nasal obstructions, the use of court plaster to hold the mouth closed at night is sometimes advisable.

In a case where there may be a question as to whether or not orthodontic treatment is necessary, it is my practice to take impressions, make models and then examine the case at intervals of three months. In some instances a natural improvement occurs and corrective treatment is not required. If such improvement is not apparent within a reasonable time, treatment should be applied. I have never been able to reconcile my ideas to a mathematical scheme of diagnosis in regard to the width of dental arches. Neither can I recommend the widening of dental arches to make room for permanent incisors prior to their eruption, except in extreme cases of retarded development where it seems positive that a natural development of the arch is impossible.

In this short paper it is impossible to consider many factors which might have an influence in a decision as to the time for corrective orthodontic treatment, for, after all, each case is an individual problem involving the possibilities and limitations of such treatment.

MEETING A FEW OF THE TECHNICAL AND CLINICAL DIFFICULTIES INVOLVED IN ORTHODONTIA*

ERNEST N. BACH, A.B., D.D.S., TOLEDO, OHIO

FIELDS in research having direct bearing upon orthodontic treatment have been quite limited. Papers have been presented on histories, diagnoses, treatment, bone growth, appliances and a score of other equally or more important subjects. Unless one is to make a report on progress, research, new mechanism or the like, it is difficult to prepare a discussion on subjects directly affecting orthodontic treatment which have not already been presented by paper or clinic.

The object of this paper will be to deal with certain phases of appliance construction, clinical consideration of same, with reference to methods of construction, difficulties encountered, and some ways of anticipating and means of overcoming them.

The use of orthodontic appliances is the one physical means we can employ in treating malocclusion, and is no doubt the greatest factor at our command. Many statements have been made regarding the mechanistic turn of mind of the orthodontist and of the dental profession in general. Regardless of the justice these charges imply, it is doubtful whether you and I shall see the day when the mechanical side of orthodontia will be thrown in the discard. No other means now within control can fill this vacancy. I am well aware of the advocates of muscle training, exercise and development through stimulation. They accomplish wonderful results, especially in many young patients, before resorting to orthodontic treatment to induce desired changes.

It has been stated by many of our profession that much harm as well as good may be done by the indiscriminate use of appliances, both orthodontic and otherwise, through lack of knowledge of the mechanical principles involved in their operation. One will find distributed throughout orthodontic and dental literature a detailed description of the various types of appliances, both obsolete and in present use.

I am of the opinion that no one type of appliance can be effectively used in all classes of malocclusion. The Mershon appliance with its auxiliary attachments has its place. The edgewise arch and other Angle appliances have their place. The Johnson automatic twin wire appliance has its place. Likewise have the soldered lingual arch, the high labial arch, and many other appliances.

Operators who have designed particular appliances invariably are especially proficient in their manipulation, while others would not consider that type as their choice. Adverse criticism or condemnation of an appliance should not be made because of the lack of skill or understanding of a par-

*Read before the New York Society of Orthodontists, New York, November 15, 1932.

ticular type which an operator has unsuccessfully used. Good or favorable results are not always obtained with one's pet or favorite appliance or method of treating a particular case. The more we delve into the science of orthodontia and follow its advancement, the more we must be convinced that heredity, nutrition and growth factors play a more important part in our work than do the things we use most—namely appliances. However, we cannot yet treat our patients along these lines to the exclusion of mechanical stimulation.

There are very few methods of treatment which do not involve some old principle of appliance construction. Progress has been made, however, in the way of construction, refinement both in the size and shape of materials and in the material itself.

It is our plan to give new materials put on the market by reliable dealers a fair trial. This does three things:

1. It familiarizes us with the new developments in the particular field.
2. These very often form the basis of new ideas.
3. We gain some idea as to their application and efficiency in our hands, thereby establishing a basis for past and future comparisons.

The following statement, in substance, is attributed to the late Dr. J. Lowe Young. "The lingual arch is all right, but when you want to move teeth use the labial arch." For the past number of years it has been a rather routine procedure, as far as routine in appliance construction can go, to use a combination of a lingual removable arch and a labial arch in treatment of malocclusion. This has been discussed in a previous paper but may be very briefly summed up here. The lingual arch with its auxiliary attachments is used for stimulating lateral development in molar and premolar regions; and the labial arch, either alone or with its finger springs, etc., is used in connection with the six anterior teeth. No standard type of labial arch is used, the one judged best for the particular case being prescribed; and, like the schedules of some of our railroads, "always subject to change without notice."

METALLURGY

Before dealing with some of the points in construction of appliances, it seems that a short review of the metallurgy of precious metals which we use continually would be fitting and proper. I likewise feel the same regarding some of the stainless steel alloys which are finding their way into our hands.

The main precious metal content of orthodontic bands and wire being gold, platinum, iridium and palladium, varied percentages of these elements can be made possessing greatly varying working qualities. A change in percentage of either of the above constituents or the addition of a base metal, such as copper, will result in a decided change in the physical properties of the alloy.

We all, more or less, have our troubles in arch fractures, and I dare say the large percentage of these occurs on the lingual arch in the region of its attachment to the molar bands. Mr. Reginald V. Williams, A. C., of Buffalo,

in a paper presented before the American Society of Orthodontists in St. Louis, enumerated the major reasons for arch failures:

1. Using wires of exceptionally high tensile strength and low ductility
2. The hardening treatment either deliberately performed or as a result of soldering.
3. Excess of heat in soldering operations.
4. Hot manipulation of the arch wire.
5. Fatigue through manipulation by the patient.
6. Defective materials.

A few of these points will be discussed, but for further details you are referred to Mr. Williams' paper published in the INTERNATIONAL JOURNAL OF ORTHODONTIA, ORAL SURGERY AND RADIOGRAPHY, November, 1931.

Many operators wish the utmost in springiness in their wires. Springiness is synonymous to hardness, and hardness goes in inverse ratio to ductility. In other words, a wire which is soft promises much less springiness than one which is hard; consequently, an extremely hard wire—that is, one which possesses a great amount of springiness—will invariably fail (meaning break) during cross bending, especially at sharp bends. A wire possessing less spring and greater ductility will stand more strain and abuse especially in the region of the shorter bends.

There are two principle methods of producing springiness or hardness in precious metal alloys: (1) by changing the composition of the alloy, (2) by exposing the wire to heat treatment.

The first is not directly under our control. In order to produce hardness and springiness in orthodontic wires, 12 to 15 per cent of base metal could be added, such as copper and a small amount of nickel. With this composition extreme oxidation would result when the wire is heated, which would be difficult to remove. A wire made from this alloy could be readily annealed, increasing the ductility and decreasing the hardness or springiness by heating to a dull red temperature and quenching immediately. If, however, it be subjected to prolonged soldering operations in the neighborhood of a dull red heat, it becomes exceedingly hard and brittle, thus laying the foundation for future trouble.

Most of our precious metal wires of high fusing point contain gold, platinum, palladium and iridium in varying combinations of any two or all of these elements. The last three elements mentioned make up approximately 25 per cent of the total of the alloy, the remainder being gold. With this alloy the oxidation problem becomes nil, the tensile strength remains relatively high, and ample ductility is maintained. Wires made from these alloys are not subject to the various changes in hardness through heat treatment. They are quite stable and uniform under all conditions.

Hardness in high platinum content alloys can only be imparted through cold work. However, not only is extreme hardness such as produced by cold work hazardous from the standpoint of physiologic tooth movement and breakage, but in my experience no need for such extreme springiness has been found. Some may prefer one make or brand of wire to another because of the "kick" or stiffness it may possess, especially those used in the form of

springs. All that can be said regarding your choice is "let your judgment be your guide."

The second method of producing varied working qualities in orthodontic wires and which is more or less at our command is that of heat treatment. More trouble with wires, especially lingual arches and springs, has arisen from heat applied during the construction of the appliance than through intentional heat treatment. As stated before, prolonged soldering applied at a dull red temperature will produce extreme hardness and brittleness. A similar condition no doubt has been experienced by many of us who form and adapt labial and lingual arches by heat. Wires are often fractured in one or more places by prolonged heat of a second or two in the given area. Many fractures of lingual arches take place in the region of the posts for lock attachments. There are three main reasons for this:

1. The prolonged or excessive heat often employed.
2. The kind of solder used for the joints and the amount of solder.
3. Interference of the wire with opposing teeth. (The locks or tubes on the molar bands should be so placed that the lingual arch will not become crystallized at this point. If not, fracture of the wire results.)

The first reason has already been discussed. The second will be more readily explained when it is understood that solder possesses practically no elongation (measure of ductility) when air cooled.

It is taken for granted that we are more or less familiar with the basic principles involved in the soldering technic. A few points may be mentioned here for emphasis. Perform your soldering operations upon a black or dark background. This will save your eyes and make the soldering operations much easier. Joints to be soldered should fit tightly together for best results. Use the smallest amount possible to make a strong joint. Excess solder often proves a detriment and is also wasteful. Heat the larger wire first when soldering. The application of too great a heat will produce brittleness.

Degrees of hardness in orthodontic wires may be produced in three ways:

1. By heating the wire to a dull red color and immediately quenching it in water. This increases the elongation or ductility (softness), leaving the wire with less spring although retaining sufficient springiness for tooth movement.

2. By heating the wire to a dull red heat and allowing it to cool in the air. This increases the springiness or tensile strength approximately 20 per cent and decreases ductility 40 to 60 per cent depending upon the platinum group content.

3. By heating the wire to a dull red heat and allowing it to cool by the oven cooling method. The oven-cooled process as described by the Bureau of Standards consists of placing the wire in a furnace at 1290 degrees F. for ten minutes and immediately quenching in water at room temperature. Place in furnace at 840 degrees F. and then uniformly slow cool to 480 degrees F. in thirty minutes. This process increases springiness or tensile strength 12 to 15 per cent and decreases ductility 40 to 60 per cent over the air-cooled process.

Stating these heat treatment processes in terms of practical application, they may be summed up thus:

1. Chilling the heated wire in water reduces springiness and makes the wire soft and less liable to fracture at short bends. It will stand more abuse before fracturing than when air or oven cooled.

2. Allowing the heat-treated wire to cool in air restores most of the springiness and makes it less easy to bend. It will also fracture more readily than that which is quenched.

3. Allowing the heated wire to cool by the oven-cooled process will result in excessive springiness, making the wire much more susceptible to breakage especially at short bends, by tongue manipulation and abuses.

Band material does not require the extreme tensile strength that wire does, but the ductility factor is necessarily increased over that of wire, imparting that quality to the material which allows burnishing. A band material of too high a tensile strength would interfere seriously in adaptation of the band. On the other hand, a band material as soft as coin gold possesses many objectionable features. Various band materials are at our disposal, ranging from alloys of high platinum content to coin gold.

Since the physical and chemical properties of orthodontic wires have been considered, it might be well to consider gold solders in a similar manner.

Gold solders react to the various heat treatment methods in a like manner as wires. The different karat solders—20, 18 and 16—all show the greatest percentage of elongation (ductility or softness) when quenched. On air cooling, the percentage of elongation drops 35 to 50 per cent. Oven-cooled treatment reduces the ductility to 50 per cent of that of the air-cooled treatment. In terms of appliance construction this means that wires are less liable to fracture at soldered joints if these areas be given the quenched treatment. A solder of a reasonably high precious metal content and low fusing point will provide the best union of parts.

Inasmuch as references will be made in this paper to stainless steel wires, it may be of more than passing interest to consider briefly the chemical and physical properties of this material. The elements composing stainless steel are chiefly iron, chromium, nickel and carbon. These vary in accordance with the requirement of the alloy. Chromium is found in varying amounts—8 to 30 per cent. It increases resistance to all forms of oxidation, both heat and chemical. Nickel varies from 8 to 25 per cent in the various alloys. It likewise increases resistance to corrosion. The addition of a small amount of carbon to the above mentioned elements increases the tensile strength—that is, hardens the alloy. Soft stainless steel wire is an annealed, cold-worked wire and usually low in carbon. Stainless steel works similarly to other steel in regard to the tempering qualities. To harden, it is heated and quenched in oil. To soften, it is heated and air cooled. You will recall that this process is the reverse of the one employed with noble metals. Most stainless steels can be soldered with gold solder and soft solder, although with some the operation is difficult. For soft soldering stainless steel, a flux of hydrochloric acid cut with zinc is used with half-and-half solder. If there be difficulty in

making solder adhere to a smooth or polished surface, this may be dulled with the following solution:

Hydrochloric acid	90 parts by weight
Ferric chloride	50 parts by weight
Nitric acid	3 parts by weight

It may be necessary for this solution to act for five minutes or longer before "tinning" in the usual way.

For using gold solders in connection with stainless steel, 14 or 16 karat solder may be used. Anhydrous borax has proved very satisfactory for use as a flux. The formula of another flux, as presented by Dr. George Anderson of Baltimore, consists of equal parts of potassium floride and borax, and enough hydrochloric acid to make a paste. Another flux for use in that connection is made of one part boracic acid, one part borax, made into a paste with concentrated zinc chloride solution.

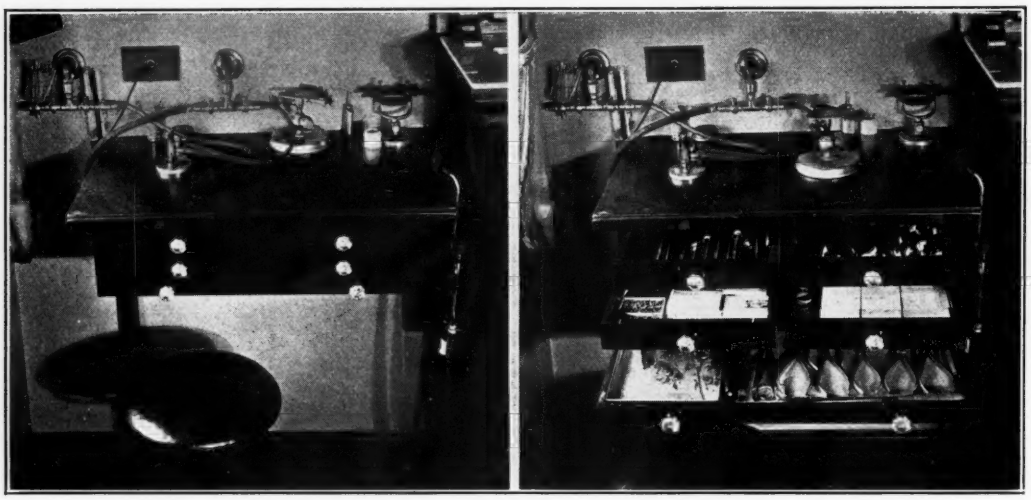


Fig. 1. Fig. 2.

Fig. 1.—A photograph of a work cabinet, one being used in either operating room.
Fig. 2.—A view of the cabinet open, showing the arrangement of the drawers and contents.

In this general review of gold solders and precious metals I have tried to show in a brief way the metallurgical picture of these materials which are used in our work and the ill effect of some of our soldering and heating operations on materials in constructing appliances. Stainless steel has been considered because of its present use by some of our members and also because of its future possibilities.

Since the purpose of this paper is to collect and present data which it is hoped will be of aid in technical and clinical procedure, I am starting with a brief description of the work cabinet which was made by a local cabinet maker. (Fig. 1.) Not being large or heavy it is fastened to the wall by two brackets at any convenient distance from the floor. The outward appearance is self-explanatory except for the top. This is covered with a solid piece of Johns-Manville switchboard panel material, one-fourth inch in thick-

ness. It is black in color (excellent for soldering background), smooth but not glaring, and is heat resistant.

On the wall at the right is the gas outlet, the air outlet being on the left Two valves are shown on either side of the tee on the air outlet, the hose from one supplying air to the burner on the desk; and the other is connected with the Melotte blowpipe hanging on the edge of the right side of the desk. The two valves nearest the tee are used for shut-off valves; only the two nearest the hose are for air adjustment, and regulated only as the line pressure changes. The gas hoses do not require this protection against extreme pressure, and the valves located on the burner and blow pipe are used to regulate the constant amount of gas used. All the valves on the wall turn to the left to open, for convenience. At the rear left corner of the desk is an 8 inch test tube of water for quenching long pieces of wire, the small tumbler being used for quenching irregular pieces of wire, bands, etc. Appearing to be held over the end of the blowpipe is a brass wire screen, about twenty mesh. This receives the lighted blowpipe in such a way that the heat which is given off is dissipated over the screen. The arrangement prevents many burns.

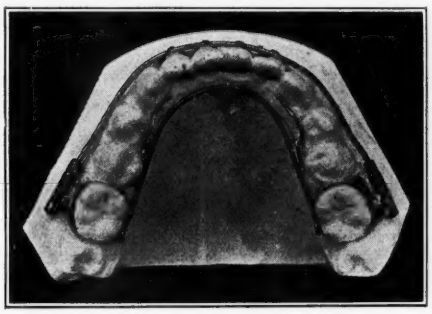


Fig. 3.—Illustrating the point that the occlusointerproximal edge of the molar bands should not interfere with opposing teeth.

Fig. 2 shows the desk with the drawers open. Here again little explanation is necessary. The bottom of the two upper drawers is grooved to receive straight wires in foot lengths, etc. The middle drawers are used for bands, tubes, etc., which I hope to have call for again some day. The lower drawer is made for a "catch all." This contains most of the technical (laboratory) pliers, tray for scraps, etc. This cabinet has given much satisfaction.

Detailed construction of appliances has been presented and recorded in the various journals by operators both here and abroad. An extensive review of this phase of orthodontia would require considerable time, but it is my object to consider specific measures which are time savers, those which aid in technical procedures, and those which may avoid or overcome difficulties and shorten operations.

Dr. Lowrie J. Porter presented a paper entitled "Difficulties in Lingual Arch Manipulation and Suggestions for Avoiding Them" at the mid-winter meeting of the Chicago Dental Society, in January, 1932. I heartily recommend the perusal of his presentation with its numerous and beautiful illustrations. The remainder of this paper will be devoted to the things he has suggested and is using, ideas from others, as well as a few of my own.

Beginning with some of the points of appliance construction and avoiding detailed operations, I shall first consider the molar bands. These are fitted directly or indirectly at the discretion of the operator. Swedging on a metal model has proved a favorite method. Whatever method is employed, be it certain the occlusointerproximal edges of the band clear the opposing teeth during trituration. (Fig. 3.) Undue trauma at these points not only results in sore teeth but increases the list of loose bands.

With bands on the desired teeth, a full impression is taken with either compound or plaster. After the models are formed with the bands on their respective plaster teeth, the model is placed on the table of the soldering stand, being firmly held by one of the clamps midway between the molars. (Fig. 4.) Thus all exposed surfaces of bands are free for soldering attachments without directing the flame on the clamps.

When lingual tubes are soldered on molar bands, an orange wood stick is used, in either end of which is placed a steel needle. One is left round to

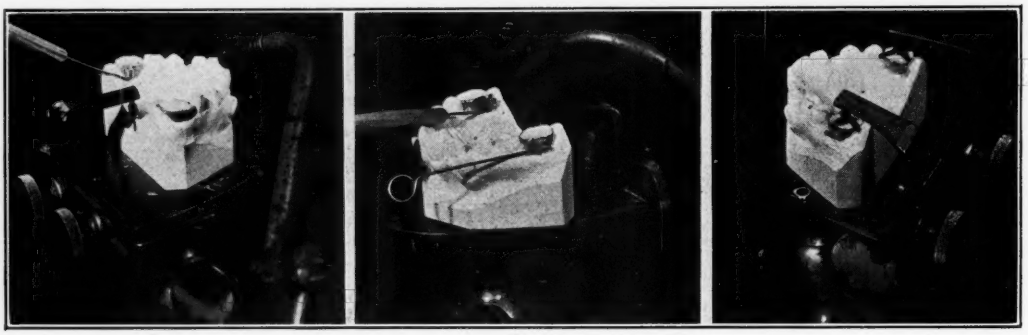


Fig. 4. Fig. 5. Fig. 6.

Fig. 4.—Models are held by one clamp of the soldering stand while all molar band attachments are soldered.

Fig. 5.—Position of lingual tube holder and blowpipe while soldering the tube to the molar band.

Fig. 6.—Correct position of the bird-claw clamps contacting the occlusal edge of the molar bands, thus holding the bands and model firmly while adapting labial and lingual arches.

hold round tubes and the other flattened to fit and hold half round tubes during the soldering operation. (Fig. 5.)

After the desired attachments are soldered to the molar bands, the plaster cusps are cut off even with the occlusal surface of the bands. After loosening the model from the single clamped position the clamps are arranged so that each claw rests against the occlusal surface of the band, avoiding interference with the lingual lock. While the claws are being held against the bands, the clamp is tilted away from and down on the model. At the same time the clamp screw is tightened. The bands are thus held firmly to the plaster teeth, and the model is likewise held firmly to the rotating table. This procedure effects the principle of a lever and holds the bands more securely than does a direct downward pressure of the clamp and tightening of the clamp screw. The ball and socket joint on the claw allows for adjustment regardless of the inclination of the molar tooth. Although the plaster becomes brittle and

porous after soldering to the molar bands, the clamps hold the bands firmly enough in position to withstand various strains while adapting labial and lingual arches. (Fig. 6.)

Fig. 7.—A photograph of a collection of lingual locks.

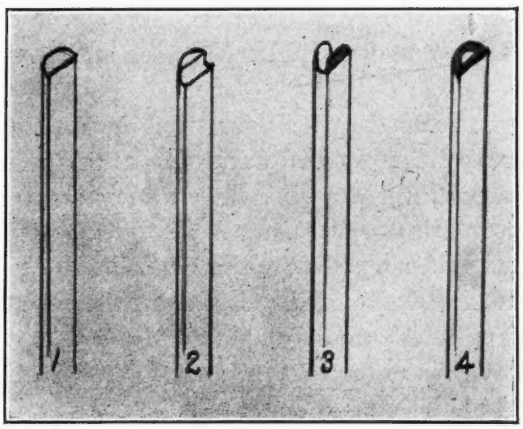


Fig. 8.—Four methods of preparing the end of half round pins before soldering to lingual arches.

About two years ago, a number of lingual locks and attachments were collected and mounted on a panel. A photograph has been made of these (Fig. 7). Their description has been recorded in the journals, and a number of them are being used extensively.

Since these were mounted, three or four other locks have been sent to me —including the Ellis one-piece arch and tubes.

If a lingual arch be used and not soldered, some form of lingual lock or attachment must be employed. No doubt the half round pin and tube lock is the one most commonly used. Difficulty has been encountered by some when soldering the half round pin to the lingual arch, the main difficulty arising from solder flowing onto the pin.

There are four quite satisfactory methods of effecting this union, and all depend principally upon the preparation of the end of the half round pin to be soldered. (Fig. 8.)

1. After dipping the end of the pin into Steele's anti-flux and burning off the residue, file the end of the pin flat and leave it bright. Solder will adhere only to the bright surface. Using the anti-flux as just described in connection with the other three methods, filing last only that portion to which solder is to adhere will save much annoyance. Always use the least amount of solder

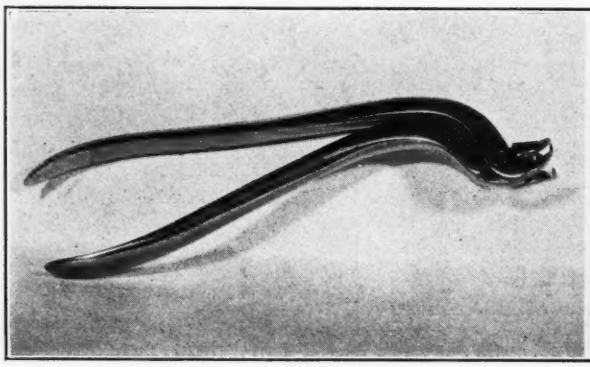


Fig. 9.

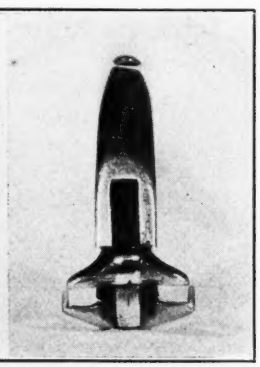


Fig. 10.

Fig. 9.—A side view of the pin removing pliers.
Fig. 10.—The end view of the pin removing pliers.

consistent with efficiency, placing it on the arch first and in the exact location desired.

2. A notch may be formed by a file or stone in the end of the pin at right angles to the long axis of the pin and parallel with its flat surface, and of size and shape to receive the lingual arch. Only a very small amount of solder is needed for this joint, melting it on the arch first. Or another way:

3. A similar sized and shaped notch is made in the end of the pin in the shape of a U by following instructions similar to the second method.

4. Making a sharp bevel entirely around the end of the pin will prevent excess solder from flowing onto the pin, and will fill in the V space between the arch and the end of the pin.

A drop of oil in the tube will assist materially in inserting and removing the pin during appliance construction. This is usually repeated before cementing appliances in place, to make easier the removal of the arch.

Another aid for separating lingual locks which bind or stick is found in a pair of especially designed pliers. These are designed for intraoral use, although they are of equal value at the bench. Figs. 9 and 10 illustrate the

principle. The plier is designed for use with all four molar bands and is patterned after the Lowrie wire stretching plier. The advantage of the design allows the pin end of the plier to lie in a plane with the pin in the lock, which could not be possible with an ordinary straight handle plier in the mandibular arch although the straight plier possesses the same beaks. It is designed for use with any lock employing the telescoping principle.

The point of the lower beak is placed against the free end of the pin in the lock and the flat surface of the upper beak is rested on the occlusal end of the tube. Compression of the beaks forces the pin out of the tube. Difficulty may be encountered in the mouth in two ways:

1. Due to the location of the gingival end of the tubes it is often difficult to insert the small end of the plier into the tube.

2. If this is not accurately placed, the plier will break if excessive pressure is put on the beaks, for the location of the tubes necessarily calls for a

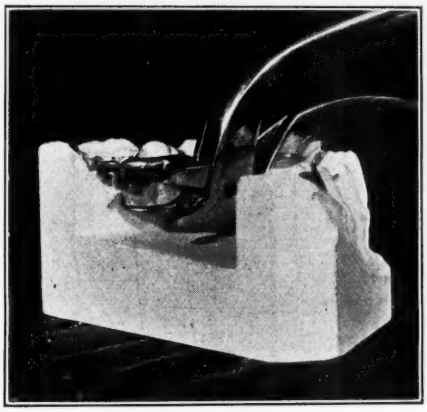


Fig. 11.

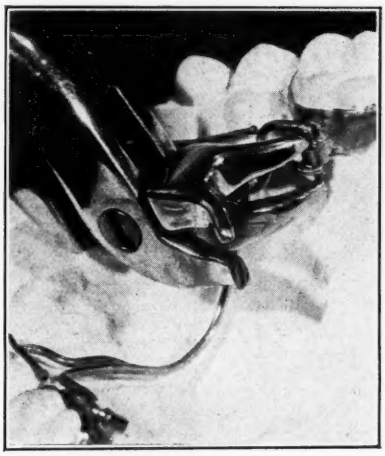


Fig. 12.

Fig. 11.—Illustrating the adaptation of the pliers in removing the pin of the mandibular lock.
Fig. 12.—Illustrating the use of the pliers in connection with the maxillary lingual lock.

small instrument. For technical (laboratory) use, gingival plaster can be removed and the view not obstructed as in the mouth.

Figs. 11 and 12 are self-explanatory.

Another very useful plier is the curved Howe plier. Grooves are made in the beaks (after Abell), one parallel with the handle and the other at right angles to it. They hold round wires securely. The soldering tweezers with notches (after Oliver) near the end are also very helpful in adaptation of wires by heat.

Locks involving the principle of a pin and tube must be held together with a locking wire or other mechanism. The customary provision consists of a small wire soldered to the distal extension of the arch and recurved to engage the gingival end of the tube. This arrangement predisposes to trauma of the interproximal gingiva due to food impactions and protection of tissue. (Fig. 13.)

A 21 gauge wire soldered on the gingival side of the arch 5 mm. or 6 mm. anterior to the pin and bent close to and following the outline of the arch and pin to engage the gingival end of the tube, will overcome one objectionable feature just referred to.

Protection of the gingivae by appliances will produce hypertrophied tissue of equal magnitude to that produced by direct appliance irritation.

An appliance which has given much satisfaction in expansion cases over the past six or eight years is a rather simple one to construct. It consists of either round or half round pin and tube lingual locks. In reality it consists of a plain lingual removable arch in which the section lingual to the anterior teeth has been removed and replaced with a Barnes tube. Expansion is gained

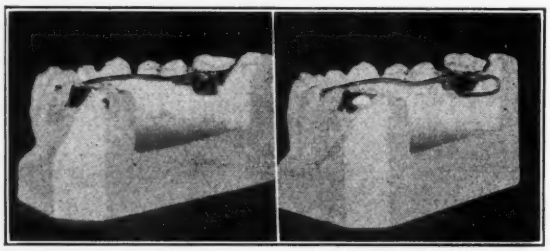
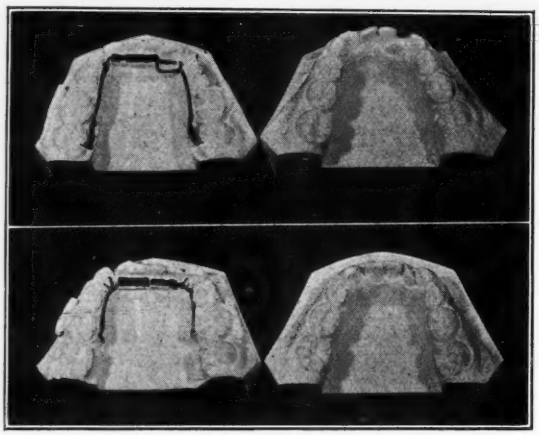


Fig. 13.—Two locking wires. The one on the right predisposes to trauma of the soft tissue. The one on the left appears to be of a better design.

Fig. 14.

Fig. 15.



by unscrewing the tube at the rate of 1 mm. or so each week. This produces a direct pressure in the region of the canines but a spring pressure posteriorly to the canines, the farther posteriorly the more gentle the spring force.

Two impressions were taken of cases with these appliances in place. The wires have been outlined with ink and the models photographed along with the original models (Figs. 14 and 15).

To increase stability of the lingual arch three methods may be advantageously employed:

1. Small loop projections are soldered on the lingual surface of canine bands engaging the lingual arch. (Fig. 14.)

2. The other two—similar in principle—consist of, in one case, lingual extensions of the arch ending in an occlusal rest in the lingual groove of the tooth distal to the banded tooth; the other consisting of a similar extension

but soldered to the molar band. (Fig. 15.) The fixation qualities of the latter are superior to the removable extension. The principles involved are obvious.

Many so-called overbite cases require mechanical means of correction. Dr. N. F. Muir of Roanoke, Va., recently designed an appliance which will be briefly described. It consists of a lingual removable arch of 0.036 to 0.040 inch in diameter and is so constructed that the anterior segment rests midway occlusogingivally on the lingual incline of the anterior teeth. Four V-shaped pieces of wire with free ends toward the teeth are soldered to the arch in such a way as to form a series of bite planes for individual teeth. The height of the planes is determined by the points of contact on the lingual inclines of the teeth. A labial arch is always used in connection with this appliance. (Fig. 16.)

An appliance recently constructed to close spaces resulting from extraction of the maxillary first premolars is shown in Fig. 17. It was designed by Dr. H. C. Shotwell of Lynchburg, Va., and consists of banding the first molars and second premolars and canines. A high labial arch is used. Two tubes

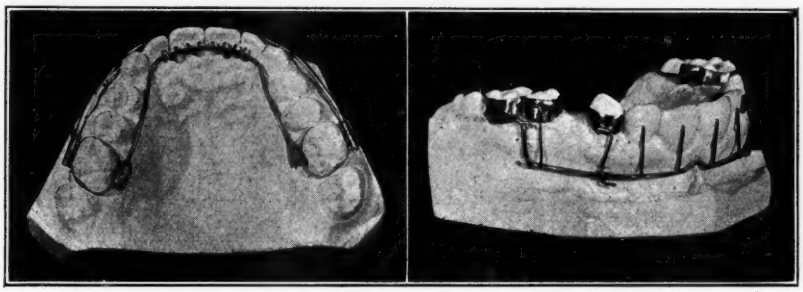


Fig. 16. Fig. 17.

Fig. 16.—An adjustable bite plane, designed by Dr. N. F. Muir.
Fig. 17.—An appliance for moving canines distally, designed by Dr. H. C. Shotwell.

are placed on the arch before bending. On these are soldered extensions which engage the horizontal tube on the canine. The tube on the arch is connected by a silk or rubber ligature to the distal section of the arch. This has a retraction force which is exerted on the canine which must move bodily in the posterior direction.

An attempt to review or even to list the numerous shapes into which wires can be bent to form springs would involve considerable time. In my judgment, the simple spring is generally the most efficient and least troublesome.

Springs, to function efficiently, should be of such size and shape as to be capable of producing desired effects. They should be attached to the arch with the least possible solder and at an angle not less than 45 degrees to the arch. (Fig. 18.) This will prevent pinching of soft tissues between the wires. Heating the free end of wires and springs forming a small ball or round surface leaves a smooth end to a wire.

I have tried many of the practical designs of lingual springs for tooth movement, but experience has proved to my satisfaction that the anterior teeth can be cared for much more efficiently with the labial than with the lingual arch.

Long springs extending from second premolars to the central or lateral incisors in my judgment are not practical. They become more effective and better under control if they engage attachments on banded teeth in the anterior region. But even then they are not as easily adjusted or controlled as the shorter ones. The slightest excess pressure in the anterior region will cause the spring to slide occlusally on the lingual incline surfaces of the incisors and canines producing a tipping of the anchored teeth and a depressing action of the anterior teeth. This tipping may be partially prevented as stated before by providing occlusal rests on the adjacent distal tooth, providing there be one.

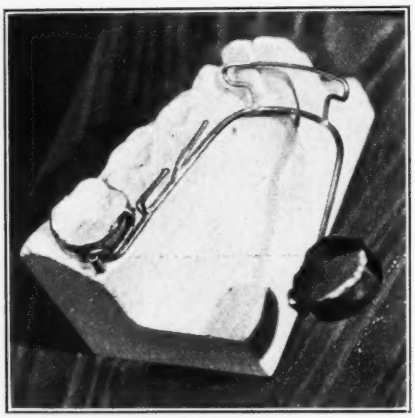


Fig. 18.—Attach springs not less than 45 degrees to the arch wire.

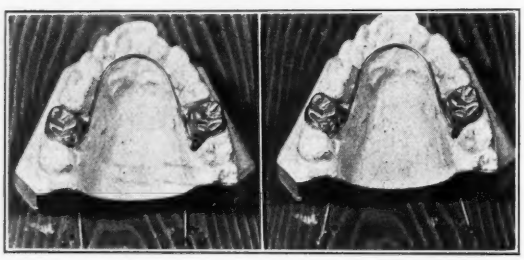


Fig. 19.—Adjustment of locking spring wires on the left model is made. Right model shows effect on rotation of molar teeth after releasing clamps holding the molars.

If it were possible to formulate a law relative to long simple springs, it might be stated thus: Manipulation and control of a spring are directly proportional to its length. This may not be true; however, it formulates an idea.

Loop springs attached at both ends have given much satisfaction over a long period. I have been very partial to the high palatal arch using this type of spring. Designed in this manner, enunciation is clear, less breakage is encountered, the appliance is much less annoying to the patient and is not easily displaced.

A thin layer of solder is flowed over the lingual surfaces of incisor bands. It leaves a smooth surface and strengthens the band, consequently lessening the number of loose bands.

In the judgment of many operators, the use of spring pressure is the ideal method in securing rotations and general movement of teeth, especially in rotating banded molar teeth.

Very often it is found true that the rotation of the maxillary first molars will assist in establishing the better anteroposterior relation of the buccal teeth. This can be accomplished very satisfactorily by the use of a lingual arch described some time ago. Round vertical tubes are used on the molar bands with locking spring wires soldered on the arch. By pressures on these springs two types of rotations may be produced. First, the tooth may be rotated as though the vertical axis of the tooth were the center of rotation. Again, it may be rotated using the tube as the center of rotation. The pressure of the springs is made very gentle, thereby avoiding a severe sudden strain on the tooth which happens when a similar adjustment is made with a lingual arch employing a half round pin and tube. Fig. 19 clearly demonstrates the points.

Springs, arches, tubes, etc., are all adapted on the model when possible. Frequently anterior teeth supporting bands are broken off during construction of the labial arch. This is easily prevented by the use of staples made from 18 or 19 gauge nickel silver wire. They are made a little narrower than

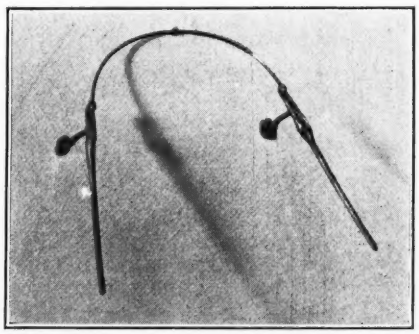


Fig. 20.—Method of attachment of stainless steel wire to gold platinum wire, avoiding loss of temper.

the width of the tooth and approximately three-fourths of an inch long. Ordinary small staples may be used and discarded with the model. Before the impression containing the bands is poured, these staples are fastened in the impression of the banded anterior teeth leaving the free ends to be imbedded in the plaster. This eventually gives us a model with the anterior banded teeth reinforced by the wires just referred to. The teeth withstand pressures exerted during construction of the labial arch.

The late Dr. Hawley's method of aligning anterior teeth with a small round wire, and later effecting apical movement, has considerable merit. I have used the stainless steel wire 0.015 inch in diameter for alignment purposes in connection with both bracket and tie bracket bands, and with very satisfactory results. This wire is much more resilient than the same size in gold-platinum. Being much smaller than the buccal tubes, a method was conceived to overcome the situation. A section of the regular labial arch was used to engage the buccal molar tubes on either side connecting the steel wire with the regular sized wires forming a labial arch. A very short section of a small round tube was gold soldered near the free end of the large wire and parallel to it, the ends of the steel wire were passed one-fourth inch through

these tubes and soft soldered to the large wire. This does not destroy the temper in the steel wire where it is soldered (Fig. 20), gold soldering no doubt would. Whether stainless steel or gold platinum wire be used, the teeth being moved should be banded and some provision should be made for attachment to the labial arch in the form of either a McCoy open tube, Ketcham hook, Angle tie bracket band, etc.

After the incisal edges of these teeth are in the desired alignment, necessary bodily movement may be brought about by one or more of the well-known methods. However, the small steel wire will not retain its temper if heated sufficiently to melt gold solder.

Until recently little has been done in orthodontia in the way of using stainless steel appliances. A few months ago Dr. George M. Anderson gave a demonstration on making appliances from this metal. Parts are united by 14 karat gold solder using his flux described earlier in the paper—namely, potassium fluoride, borax, and hydrochloric acid. Both gold alloys and stainless steel may be soldered to stainless steel. The principal thing to avoid is excessive heat. A 19 gauge wire will stand considerable heat before losing its temper, but as soon as the solder melts withdraw the wire from the flame. Through experimentation and practice the soldering operation will be mastered, thereby retaining the temper in the wire. Plunging a wire at dull red heat into water will restore part of the temper.

One of the next steps after the appliances are made and ready to be placed in the mouth, is to obtain detailed information about tooth pathologic and general oral pathologic conditions before cementing bands in place. Make special note of abnormal tooth conditions recording in particular all white spots, white and brown lines, stains, fillings, etc., checking all five surfaces. Do this especially on all teeth proposed to be banded. Also note any hypertrophied tissue or tendency in that direction, and gum recession. The parents' attention is called to these conditions, explaining to them that what damage is done will probably remain for all time and will be there when the appliances are removed.

Before any bands are cemented, we must clean the teeth to be banded, although the patient may have had a prophylaxis only a half hour before. That responsibility belongs to the orthodontist.

Before the final placing of appliances in the mouth, the lingual arch and molar bands are assembled, both bands being cemented with one mix of cement. In case of resetting both appliances, enough cement is mixed for all four molar bands, cementing the mandibular left band first, then the mandibular right, then the maxillary left, then right.

For the last few years we have been covering the cotton rolls with gauze (another idea of Dr. Porter's). The roll being wrapped and made tighter than the original, it does three things. It is stiffer, easier to hold in position, and the wrapping prevents shreds of cotton from being cemented under the band. Just a few seconds before the mix is ready to insert into the bands, rolls are placed between the cheek and band on either side, below, and another held by the tweezers between the left hand and the tongue. The operator holds these while the band and tooth are dried by compressed air. After

this band is seated the lingual roll is removed and a new one inserted between the right band and tongue, being held by the fingers. This tooth is dried and the band seated. If maxillary bands are to be cemented, the left is done first, using a roll between the cheek and band and repeating for the right band. Immediately after the bands are in place a roll is placed over each mandibular molar band, and the patient is instructed to close tightly and hold for three or four minutes. When the cement is hard, most of the excess can be chipped off and taken out of the mouth, adhering to the gauze on the cotton roll.

While difficulties may have been encountered during the construction of appliances, we find with some of our patients during treatment that our troubles of breakage and adjustment so overshadow our previous difficulties that it makes appliance construction a real pleasure. Many breakages may be repaired by free-hand soldering, while some repair cases require models to complete the job. Dr. Herbert A. Pullen's method, already described in the journals, is a very simple but exacting method of taking care of this department of our work.

Should it be found necessary to make a change in a lingual arch either inserting a new section or straightening kinks, etc., the following method was

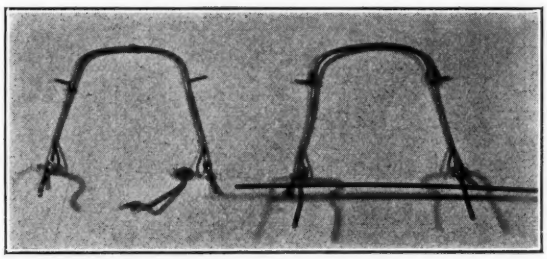


Fig. 21.—A scheme of Dr. C. F. Bowles for holding the free ends of the lingual arch in their relative position while changing any other portion of the arch.

recently demonstrated by Dr. C. F. Bowles of Richmond, Va. It is a clever scheme to hold the ends of the arch in their original position during any operation which involves changing or repairing the arch. (Fig. 21.) Two gold platinum wires 0.036 or 0.040 by one inch long are soldered to the flat surfaces of two half round tubes respectively. The wires are soldered parallel to the hole and the free ends bent in the shape of the letter S which lies in the plane of the flat surfaces of the tubes. The tubes are placed over the half round wire, the arch lying with occlusal surface on the table. A piece of 0.036 or 0.040 inch wire is laid over the letters S and soldered to them. Replacing a section of the arch may be done now, but the pin end of the arch will remain in exact relation as before. This scheme may be used with almost any arch and lock not employing a simple round tube or tapered round tube.

Fig. 22 shows the arrangement of objects about the chair. Nothing has been left in front for the child to play with, the bracket table and cuspidor being the only objects there; neither is there an engine hanging in view of the patient. The engine is located under the seat of the chair and a double cable used, the end of which with the handpiece are seen at the back of the chair. Likewise the air hose and connection are found there. They both are conveni-

ently placed, easily accessible, and the young patient never makes a disturbance at the sight of a buzzer because he does not recognize the handpiece as being part of that outfit.

Not least, but usually put off to the last, is the trimming of the models for records. It was a strange coincidence that two persons living many hundred miles apart should fall upon an idea very similar in principle and their thoughts upon that idea be consummated at approximately the same time, but such is the case with Dr. Adelbert Fernald of Boston and myself.

Some two years ago, and since Dr. Fred Wolfsohn presented his electrically driven model trimmer consisting of a cutting knife traveling in a vertical direction, and Dr. C. H. Juvet his electric model trimmer using a sandpaper

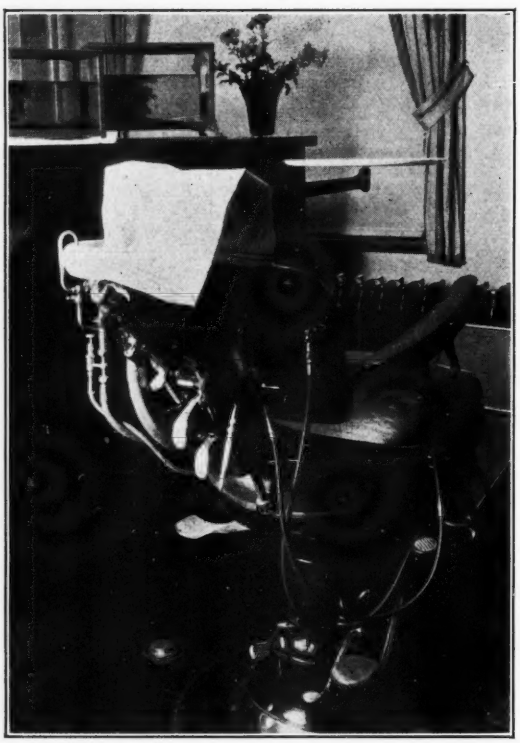


Fig. 22.—Showing the handpiece and air hose attached to the back of the chair. Nothing is left in front for the patient to play with.

disk for cutting or polishing, the idea was conceived of combining the two principles—namely, that of incorporating two cutting blades in a disk and having it electrically driven.

Some four months before the meeting of the American Society of Orthodontists in Toronto, the plans were drawn up preparatory to making such a machine. It was deemed advisable to wait and take the plans to Toronto to show to a few interested men with the view in mind of receiving any suggestions which might be incorporated in such an appliance.

We had incorporated in our plans a few features which require but little description. Due to the price of motors being so low, the original idea of using the Ritter motor in a detachable arrangement from the trimmer proper

was abandoned. In its stead a quarter horse General Electric motor was adopted, making it all one unit. (Figs. 23 and 24.)

A cast bronze housing surrounds the back and periphery of an 8 inch disk which contains two blades 3.5 inches long. Three-quarters of the other side of the disk are covered by heavy sheet brass. The other quarter is left open for feeding the plaster. On the cutting side of the disk is an adjustable stand 5 by 9 inches. The edge next to the disk is hinged to allow adjustment of the table so that the back of the model may be trimmed at right angle to the plane of occlusion. This principle is incorporated in Dr. Wolfsohn's machine and is accredited to him. In my judgment the adjustable table is nearly equal in value to the cutting part.

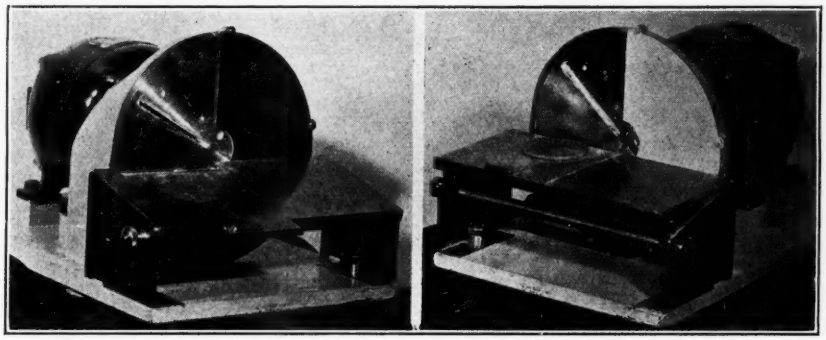


Fig. 23. Fig. 24.

Fig. 23.—Showing the end and left side of the electric plaster model trimmer, the table tilted to the lowest point and "sliding table" to slide the models toward the cutter.

Fig. 24.—The electric plaster model trimmer with table set at right angles and small round disk used for rounding the front of the lower models.

Another feature of the trimmer is a slide which is incorporated in the table. Models may be placed on the slide and fed to the cutter, or the slide may be made stationary by a set screw underneath.

To cut the rounding surface on the front of the mandibular model, provision has been made in the form of a turntable. Models are placed on this table in the desired position and rotated against the cutter. This produces an accurate smooth surface. Various sized arcs can be made depending on the distance the front of the model is away from the center of rotation.

The plaster chips are collected in a bag, and we are working on an arrangement to take care of any dust which may form when dry models are cut. Models are trimmed very accurately and quickly. The edges and angles are left sharp and not broken off and the surfaces are smooth.

GROWTH OF THE FACE AND OCCLUSION OF THE TEETH IN RELATION TO ORTHODONTIC TREATMENT*

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THE recent increase in number, variety and complexity of appliances has brought about a situation which tends to confuse the problem of malocclusion of the teeth and to obscure the purpose and aim of orthodontic procedure. Every orthodontist is quite familiar with the feeling of uncertainty when confronted with a new and complicated case of malocclusion. The mechanical requirements in treatment and the difficulties to be overcome appear to baffle us most. When I first entered the field of orthodontia, the matter was quite simple. I was trained to use but one kind of appliance, and the variety of forms in which malocclusion of the teeth appeared had to be treated with it. As a consequence, I have disciplined myself to think that what counts most in successful orthodontic treatment is not so much the kind of appliance to be used as a clear understanding of the aim to be gained. The prevailing opinion has usually been the other way around. As a result, orthodontic appliances have always been a center of great attraction. But what appears somewhat curious now is that many orthodontists seem to be baffled more by choosing appliances than by the problems to be solved with them. From general appearances it is beginning to look as though the puzzle of malocclusion of the teeth has set us in motion, but in the attempt to unravel it we are not quite sure whether we are coming or going. In the long run it may not make much difference, but those who are eager to get somewhere are at a loss as to which is the most direct way.

Orthodontic appliances, I was taught, are to be used for the purpose of treating malocclusion of the teeth; but I was impressed with the fact that the simpler the appliance, the better it performed its task. I was also taught that malocclusion of the teeth is fundamentally due to "arrested development"; but arrested development, it was maintained then, is susceptible to "mechanical stimulation." I consequently gained the idea that orthodontic appliances are mechanical devices endowed with the property of stimulating growth. Thus the object of orthodontic treatment, according to these teachings, was primarily to establish normal occlusion of the teeth; but the inference was that the achievement was due to a reawakening of the dormant growth of the alveolar arches, the jaw bones and the entire face. It may still be within the memory of some that, when Dr. Angle first brought out the pin and tube mechanism, it was hailed as "the bone growing appliance." The proof of the correctness of these teachings and ideas was furnished by results from actual practice and rested on rationalization. Since the patients of the ortho-

*Read at the annual meeting of the Southern Society of Orthodontists, Knoxville, Tenn., Nov. 2, 1932.

dontist are children, since the faces of children increase in size and change in form in the course of time, and since orthodontic treatment extends over periods of years, it was quite simple to conclude that orthodontic appliances stimulated growth and brought about facial changes, while the teeth were being moved into their proper occlusal relation.

The testimony gathered by careful investigations does not seem to warrant such conclusions. Recent observations made by following up a large number of children support a rather contrary view. For example, changes are found to occur in faces of children who had no orthodontic treatment, or when orthodontic treatment was carried out for such disturbances in the occlusion of the teeth as have no noticeable effect upon the growth of the face. It has also been observed that, despite successful orthodontic treatment, the faces of some children change very little and the faces of other children change much, although orthodontic treatment was not successful at all. In view of such observations, it seems reasonable to make the provisional assumption that *the growth of the face is apparently not dependent upon the effect of orthodontic treatment, but that the success of orthodontic treatment may be dependent upon the effect of growth.*

DEVELOPMENT OF THE FACE

What evidence may be furnished to support this assumption? It is a general biologic fact that all immature organisms mature by the process of development. Children too, by a gradual process of development, actually become adults. In the course of development the entire individual increases in size and changes in form. What is true of the whole is also true of its parts. Like the entire individual, the face too is transformed from infancy to adulthood by a series of changes due to development. What these changes are is as yet not known. An approach, however, has been made to learn something about them. Would it not seem more reasonable to learn to understand the nature of these changes first, before attributing them to a definite cause, such as the effect of stimulation by means of mechanical appliances? Would it not also seem plausible to assume that by a proper understanding of the nature of the changes a clearer view may be gained of those effects upon the face which are really due to orthodontic treatment?

I. GROWTH OF THE FACE

It is, of course, common knowledge that development, whether it refers to the human face or any living organism, is due to growth and differentiation. The general aspects of those phases of development were pointed out in 1926[1] on the evidence derived from a study of skeletal material of ancient American Indians at the Museum of Natural History. The evidence supporting the views presented now is derived from a study of 1196 series of facial measurements of patients in my practice with dentitions in all sorts of occlusion. There were 526 males and 670 females. Repeated measurements were made from two to seven times at yearly intervals. I am of the opinion that scientific research need not be limited to special laboratories. The patients in a private practice constitute as good material as any other group of individuals. There is even an advantage

in such a study. The problem dealt with is attacked directly and the patients derive the greatest benefit from it. Of course, if seriously pursued, it is done at a tremendous sacrifice in energy, time and finances.

Both studies were made by measuring the external dimensions of the face. Since growth in the living is attained by increase in size, measurements of any growing part, if taken at certain intervals, will show differences in dimension. Accordingly, there are two kinds of measurements necessary in the study of growth. One is measurement of size, the other, measurement of time. For measuring size certain kinds of yardsticks are quite sufficient. For measuring time different devices have to be used. Calendar time, even of yearly intervals, though best known and most extensively used, appeared after several trials to be too fine a device for measuring average growth increments of the face. The scale which I established in 1926[2] seems to be more suitable for this purpose. It is based not on calendar time, but rather on anatomic manifestations. As I shall endeavor to show, the teeth, used as milestones, indicate more satisfactorily the distance covered by the growing face.

The paleontologist long ago arrived at the conclusion that in the history of the race "the most constant and dominating element of the face is the gateway formed by the mouth and arching jaws to the 'primitive gut' or digestive tract."[3] Confirmatory evidence from comparative anatomy also indicates that "around this architectural centerpiece," as expressed by Gregory, "the higher facial designs gradually developed."[3] The story of individual development likewise points to the facts that the face of the infant appears at first without teeth, that the development of the dentition is closely related to the growth of the jaw bones, and that certain phases of tooth addition and tooth elimination are found to be in close association with certain growth manifestations of the face. It is therefore quite reasonable and very helpful to use the periods of tooth accession as a time scale for the growth increments in facial dimension.

There are, according to this time scale, five principal periods or stages in the development of the dentition.* *First* (IA), when the infant is beginning to get teeth; *second* (IIA), when by the acquisition of the second deciduous molars the deciduous dentition is completed; *third* (IIIA), when the permanent first molar has been added on behind the deciduous dentition; *fourth* (IVA), when the permanent second molar has been added on behind the first; and *fifth* (VA), when by the addition of the third molar the adult dentition has been completed.

As an orthodontist, however, I was also eager to know whether growth of the jaw bones and face is more abundant before, during, or after each of these tooth groups is added on. For this purpose, subordinate periods or substages† have also been established. Thus, IC has reference to the beginning of eruption of the deciduous second molars; IIC, to the beginning of eruption of the permanent first molar; IIIB, to the time of elimination of the deciduous canines and molars, and the eruption of their successors; IIIC and IVC, to the beginning of eruption of the permanent second and third molars.

*They are indicated by Roman numerals from I to V followed by letter A.
†Indicated by the letters B and C following the Roman numerals.

If it is desired to know at what ages these tooth stages occur, it can be estimated by computation. Thus, sorting out the records of the individuals according to stage, the average and standard deviation can be obtained with reference to age. Table I gives a concise statement of the stages reached by the individuals examined, the number of individuals at each stage, the average age of the individuals and their variability as measured by the standard deviation. It also gives the differences in age between the sexes. The purpose of this table is therefore to convey the idea of the time scale used in previous studies,[4] as well as in this study. At the same time, it furnishes a means for translating the stages of development into terms of ages.

TABLE I

SHOWING STAGES OF DENTAL DEVELOPMENT, NUMBER OF INDIVIDUAL MEASUREMENTS AND AGES AT WHICH STAGES OCCUR

STAGES	MALES			FEMALES		
	AGES			AGES		
	NO.	AVER.	S.D.	NO.	AVER.	S.D.
IIA*	17	5.53	1.52	19	5.53	0.94
IIC	13	7.69	1.94	15	6.67	0.60
IIIA	115	9.00	1.41	106	8.40	1.14
IIIB	114	10.91	1.35	154	10.52	1.37
IIIC	56	12.70	1.25	68	12.53	1.54
IVA	156	14.78	2.07	248	14.89	2.16
IVC	21	18.62	2.36	22	20.05	2.28
VA	29	20.83	2.07	29	22.38	2.23

No. = number.
Aver. = average.
S.D. = standard deviation.

The letters appended to the Roman numeral indicate the following: A, complete presence of the four homologous teeth; B, shedding of deciduous teeth and eruption of their permanent successors; C, beginning of eruption of a molar tooth. Thus, IIA indicates the presence of deciduous second molars; IIIA, presence of permanent first molars; IVA, presence of permanent second molars; VA, presence of third molars. IIC indicates beginning of eruption of permanent first molars, IIIC eruption of permanent second molars and IVC of the third molars.

The instruments used to measure facial dimensions are now quite familiar to the orthodontist. An illustration of them is shown in a paper recently published.[4] They are: the spreading and sliding calipers of the anthropologist, and the "Todd head spanner" introduced to orthodontists by Professor Todd.

The particular dimensions considered in this study are:

I. *Heights* (sliding calipers used).

a. Total face, from nasion to menton.

b. Upper face, from nasion to the point of the gum papilla between the maxillary central incisors.

c. Lower face, from menton to the point of the gum papilla between the mandibular central incisors.

d. Dental (or interalveolar distance), from the point of the gum papilla between the maxillary central incisors to that between the mandibular central incisors.

e. Nasal, from the nasion to the base of the nose (infranasale).

f. Ramus, from gonion to the condyle on a horizontal line with the lowest point of the upper margin of tragus.

II. *Widths* (spreading calipers used).

a. Bizygomatic, between the two zygomas.

b. Bicondylar, between the condyles of the mandible which can be felt when the mouth is widely open.

c. Bigonial, from the mandibular angle on one side to that of the other.

d. Nasal, at the widest part of the alae nasi in relaxation. (Sliding calipers used.)

III. *Depths* (for these measurements the Todd head spanner was used).

a. Auriculonasion, from external auditory meatus to nasion in the sagittal plane.

b. Auriculoprosthion, from external auditory meatus to prosthion.

c. Auriculoinfradentale, from external auditory meatus to infradentale (between mandibular central incisors at gum line).

d. Auriculomenton, from external auditory meatus to menton.

e. Goniomenton, from gonion to menton (spreading calipers used).

I am quite sure that the matter of instruments and technic of measuring is of considerable interest to the orthodontist and should be given special attention. But, since the object of my paper is to point out some results and inferences to be drawn from them, I shall proceed to the problems entailed. The aim therefore is to dwell upon the features involved in the changes of the face as it is transformed from babyhood to adulthood. For this purpose I shall limit this study to those dimensions only which are most obvious. Moreover, since the youngest of the individuals studied already had the full complement of deciduous teeth, this study begins with stage IIA. But the trouble is that in dealing with large numbers it is necessary to use the average. As an orthodontist, however, I am mainly interested in the individual. I shall therefore use the average first, but only for the purpose of pointing out general tendencies. In this manner a pattern or "norm" can be established with which the individual may then be compared.

TABLE II

DIMENSIONS OF FACE IN HEIGHT, WIDTH, AND DEPTH FROM INFANCY TO ADULTHOOD
MALES

STAGES	AVER. AGES	HEIGHT (TOTAL FACE)			WIDTH (BIZYGOMATIC)			DEPTH (GONIOMENTON)		
		NO.	AVER.	S.D.	NO.	AVER.	S.D.	NO.	AVER.	S.D.
IIA	5.53	17	96.13	6.24	17	117.12	5.97	13	74.31	4.97
IIC	7.69	13	96.92	4.38	13	119.77	5.58	12	77.67	4.03
IIIA	9.00	114	102.62	5.43	114	121.31	5.07	69	81.25	5.31
IIIB	10.91	121	107.00	5.10	122	123.44	4.83	85	83.16	5.40
IIIC	12.70	57	109.79	5.82	56	126.47	5.08	53	87.19	5.46
IVA	14.78	154	114.34	6.66	154	130.36	6.06	104	89.92	5.82
IVC	18.62	21	120.57	5.97	21	137.19	4.65	19	95.67	5.04
VA	20.67	29	122.34	6.37	29	139.79	6.09	27	97.79	7.26

Thus from studies of averages derived from measurements of the external dimensions, it becomes quite clear that, like many other parts in the human economy representing bulk, the developing face increases in size by growing in three planes. It grows in vertical height, in transverse width and in anteroposterior depth. These three dimensions, however, are not equal, but they always stand in the same general relationship to each other; i.e., as indicated

in Tables II and III, the greatest dimension is in width, the next to it is in height and the least is in depth. By comparing the two tables it will be noticed that there is also a difference between the sexes, the average dimensions being smaller in the female. Table IV, A and B, shows the relative differences in the average of these dimensions in the female. They are expressed in terms of percentage; i.e., each dimension in the female is represented by the average percentage value of that of the male.

TABLE III

DIMENSIONS OF FACE IN HEIGHT, WIDTH, AND DEPTH FROM INFANCY TO ADULTHOOD
FEMALES

STAGES	AVER. AGES	HEIGHT (TOTAL FACE)			WIDTH (BIZYGOMATIC)			DEPTH (GONIOMENTON)		
		NO.	AVER.	S.D.	NO.	AVER.	S.D.	NO.	AVER.	S.D.
IIA	5.53	19	91.58	3.53	19	113.26	4.98	11	72.73	4.54
IIC	6.67	15	94.67	4.01	15	116.80	4.12	9	77.22	1.99(?)
IIIA	8.40	107	98.26	4.95	107	119.29	4.89	72	79.38	5.23
IIIB	10.52	159	103.04	5.76	158	123.25	5.52	106	81.49	5.31
IIIC	12.53	68	106.09	6.12	68	125.44	4.56	47	83.24	4.92
IVA	14.89	251	110.91	5.91	252	128.06	4.65	145	86.25	5.34
IVC	20.05	22	116.52	6.24	22	132.00	4.30	19	93.16	5.55
VA	22.38	29	116.38	5.25	29	131.14	4.75	21	91.43	1.70

TABLE IV

RELATIVE DIMENSIONS IN FEMALES AS COMPARED WITH THOSE IN MALES

STAGE	A			STAGE	B		
	BIZY.	T.F.H.	GON.MEN.		AU.NA.	RA.HT.	BIGON.
IIA	96.70%	95.27%	97.87%	IIA	99.78%	93.74%	98.78%
IIC	97.52%	97.68%	99.42%	IIC	96.35%	90.96%	98.86%
IIIA	98.33%	95.75%	97.61%	IIIA	95.92%	92.88%	97.32%
IIIB	99.85%	96.30%	97.99%	IIIB	97.04%	89.98%	99.08%
IIIC	99.19%	96.63%	95.47%	IIIC	98.34%	93.78%	96.93%
IVA	98.24%	97.00%	95.92%	IVA	96.65%	91.69%	96.92%
IVC	96.22%	96.64%	97.38%	IVC	93.46%	90.25%	94.87%
VA	93.81%	95.13%	93.52%	VA	91.62%	80.84%	93.87%

Bizy. = bizygomatic width.
T.F.H. = total face height.
Gon. Men. = goniomenton depth.
Au. Na. = auriculonasion depth.
Ra. Ht. = ramus height
Bigon. = bigonial width.

An interesting feature in the growth of the face is that the largest dimension increases least, the intermediate more, and the smallest most. If the average growth increments are charted on graph paper on a percentage basis with relation to the stage of development, as shown in Chart 1, the tendencies of growth can be more clearly visualized. Chart 1 thus shows the percentage additions of average growth increments of the face in three planes (total face height, bizygomatic width and anteroposterior depth). Of general significance is the fact that there is more growth in all planes from stages IIIA to IVA than there is from IIA to IIIA. I am calling attention to these three stages, because they represent the periods of life which are of special concern to the orthodontist. But, as indicated in the upper (male) section of the chart, depth (dotted line) increases at a higher percentage level than height (broken line), and height at a higher level than width (solid line). This kind of in-

crease is more typical of the males, because their faces grow more in depth than do those of the females. There are, however, some other points of interest. It is quite obvious that all lines indicate growth. But, not one of them is a straight line. This may be interpreted to mean that growth is not uniform; i.e., growth is more intense at some times than at others. Another point of interest should be noted in the lines representing growth in height and depth. Thus the dotted line indicating depth and the broken line indicating height approximate each other at certain points and diverge at other points. In the males these lines are one above the other, but in the females they cross each other's path. Since these lines represent growth in two different planes, they indicate that the intensity of growth alternates between height and depth; i.e., as growth in the one of these planes is accelerated, that of the other is re-

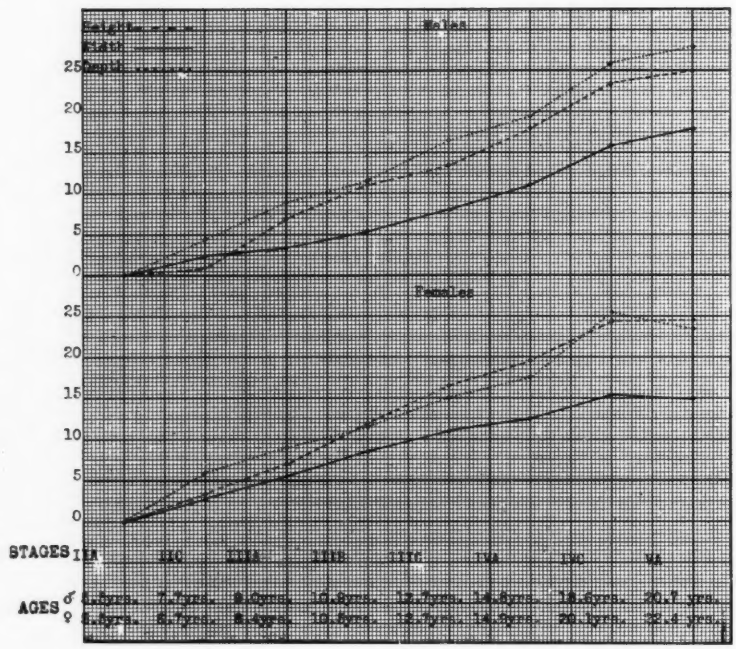

Chart 1.—Growth chart showing percentage addition of increments in height, width and depth of face.

tarded. In other words, growth of the face, though taking place in three planes, is, as expressed by Todd,[5] "not uniform and continuous, but local and discontinuous." But, taking into account the tendency of growth in height and depth, it may be added that the spurts of growth are also alternating.

Comparisons of growth increments of the same dimension in the two sexes bring out certain differences. For instance, the average female face grows in height more rapidly than the male face, until about sixteen years of age. It then slows up until twenty, remaining at the same level until twenty-two years of age. In the average male face, on the other hand, there is a spurt of growth in height from fifteen to eighteen years, after which it slows up, but continuing to grow until twenty-one years. Growth in width is not unlike that in height. The differences are only in degree, but not in kind. In depth the female face starts out with an early spurt at five, slowing down to the level

of the male increments at eight, when it equals the male. Then the face of the male speeds up and grows more in depth than the female until adulthood. A curious appearance in Chart 1 is the decline at the end stages of the female curves representing growth in width and depth of face. The decrease in these dimensions has also been observed in the repeated measurements of the same individuals. It appears that when the children grow up there is a considerable loss of subcutaneous tissue and an increase in bony increments underneath it. In females the bony increments underneath the skin seem to be insufficient to make up for the attenuation of the skin. As a result, girls beyond sixteen or seventeen years of age show either no increase at all or an actual decrease in these dimensions. In boys, however, the bony increments are large enough not only to make up for the disappearance of subcutaneous fat, but also to show an increase in dimension.

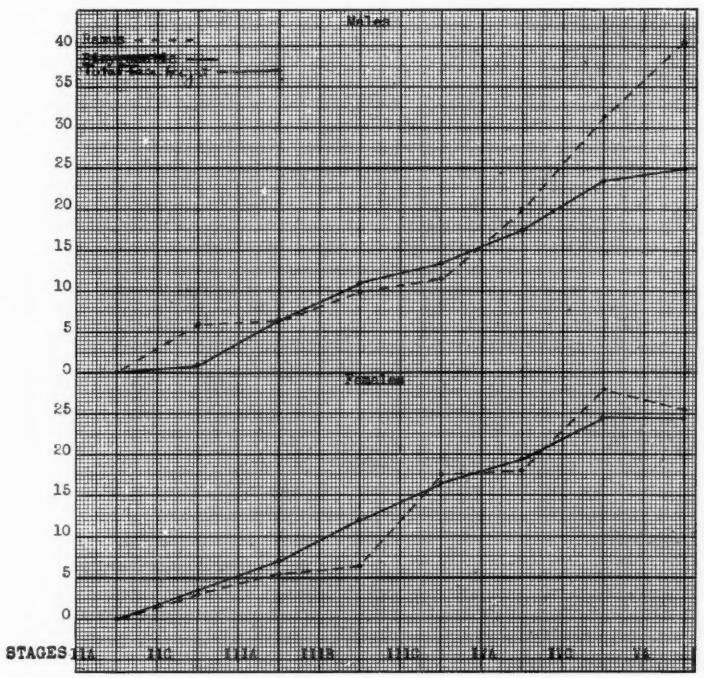

Chart 2.—Growth chart showing percentage addition of increments in total face height and ramus height.

Another important feature in the growth of the face is found when different levels of the same plane are compared. For instance, growth in height is determined by measuring the front of the face from nasion to menton. Similar dimensions can also be studied in back of the face by measuring the height of the ramus. When comparisons of growth increments of these levels are made, as was done in Chart 2, similar features appear which conform to the characteristic tendencies of growth. Thus, the discontinuous and alternating tendency of growth is again seen in the growth of the ramus when compared with that of total face height. It also shows that the growth of the ramus is in more marked spurts than that of the total face, that the face grows more intensely in back than in front and that the ramus grows more

in males than in females. Of particular significance is the fact that in both male and female there are two important spurts in the growth of the ramus. In the females the first spurt occurs from stage IIIB to IIIC, after which there is a pause to IVA. This is followed by the second spurt to IVC and a subsequent decline. This decline is somewhat puzzling, although, as suggested before, it may be attributed to the marked attenuation at this stage, of the fat

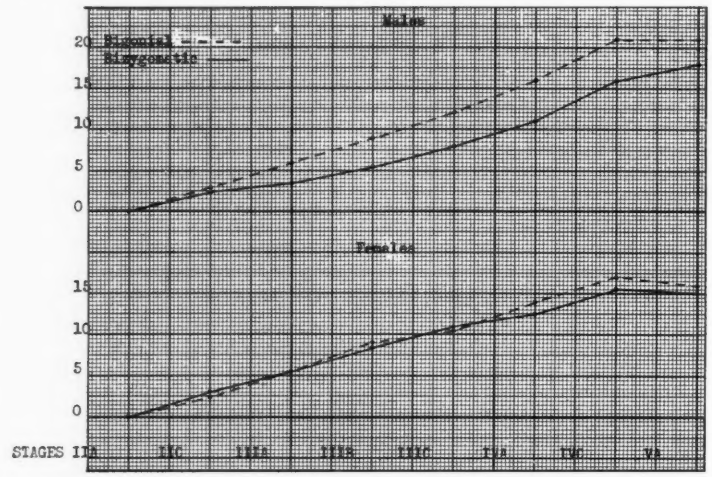

Chart 3.—Growth chart showing percentage addition of increments in bigonial and bizygomatic widths.

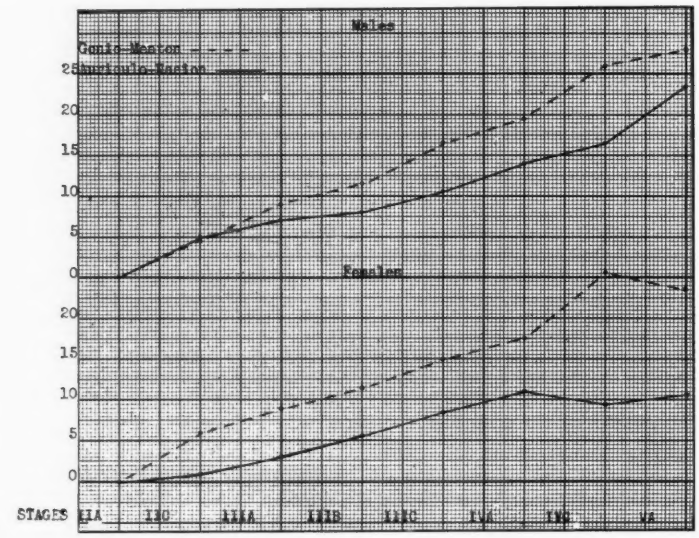

Chart 4.—Growth chart showing percentage additions of increments in goniomenton and auriculonasion depths.

pads under the skin at the mandibular angle. In the males the first spurt is from IIA to IIC, followed by less growth to IIIC. From IIIC on, the second spurt occurs without interruption to stage VA. These spurts of growth in the ramus should be kept in mind, as I shall refer to them again later.

The transverse growth increments at different levels show other features of interest. Thus, as seen in Chart 3, the percentage additions of bizygomatic width are compared with those of bigonial width. It is quite clear that, with

the exception of the points on the female chart at IIC and IIIC, the percentage additions of the bigonial width increase more than the bizygomatic width and that this increase is more emphasized in the male than in the female. Moreover, the increments in these dimensions are more uniform, more constant and more diverging in the males, but partly alternating in the females. It shows then that during growth the lower part of the face widens more than the upper, but also that it widens more in the males than in the females.

In depth too the growth of the face has certain characteristics. Thus, in Chart 4 are shown the percentage additions of the anteroposterior growth of the face. One (solid) line represents the increase in goniomenton dimension, the other (broken) line the increase in auriculonasion dimension. As shown in this chart, the dimension of the lower part of the face (goniomenton), as measured from the mandibular angle to the chin, also increases more than the upper (auriculonasion), as measured from the ear hole to the nasofrontal junction. It also shows that the percentage additions of both dimensions are higher in the males than in the females. The wider spread of the curves in the females is due to an earlier cessation in growth of the auriculonasion dimension than in the males. The continued rise of both lines in the males indicates that their facial growth in depth is greater and continues for a longer time than that of the females.

II. DIFFERENTIATION

The phase of development thus far dealt with was concerned with growth or increase in size. The phase to be considered now deals with differentiation. But differentiation is usually referred to in two ways. The one is called *histologic differentiation* and has reference to increase in complexity. Such complexity arises when in the development of an organism all cells are alike as first derived from the egg, but by the process of differentiation they are transformed into cells composing brain substance, muscle tissue or bone structure. The differentiation alluded to in the development of the face is called *morphologic differentiation*, because it is concerned with change in form. But, since a change in form is brought about by a more rapid growth in one direction than in another, it is quite clear that morphologic differentiation is really a peculiar kind of growth affecting form. So far as the face is concerned, differentiation consists in (1) changes in proportion and (2) adjustment in position.

I. CHANGES IN PROPORTION

In what way is the form of the developing face affected by changes in proportion? Differences in intensity of growth in two directions, for instance, will produce a change in form. As was shown before, the face grows more in height than in width. In consequence of this, the proportion of height and width keeps on changing as long as the face keeps on growing. The result is a gradual change in form whereby the round or square face of the baby is transformed into the long face of the adult. If we compare the average dimensions in one direction with those in another direction, we see how a

modification in form is brought about by a change in proportion. For instance, in Table V the relative values of the total face height are given in percentages of face width. It is at once clear that, as the face grows larger from infancy to adulthood, it also becomes relatively longer. But it should be noted that the face of the female gradually becomes relatively longer than that of the male. This, as will presently be seen, is not due to more growth in height, but rather to less growth in width. If a like comparison is now made of face depth, a different point of interest appears. Expressing in Table VI the anteroposterior dimensions of the body of the mandible (goniomenton) in percentages of face width (bizygomatic), the point is brought out that the face changes its form in these particulars too. Thus the face becomes rela-

TABLE V

RELATIVE AVERAGE DIMENSIONS OF FACE HEIGHT (TOTAL FACE) AND FACE WIDTH (BIZYGOMATIC)

STAGES	MALES			FEMALES		
	AGES	NO.	TO.F.×100 / BIZYGO.	AGES	NO.	TO.F.×100 / BIZYGO.
IIA	5.53	17	82.07%	5.53	19	80.86%
IIC	7.69	13	80.92%	6.67	15	81.05%
IIIA	9.00	114	84.59%	8.40	107	82.37%
IIIB	10.91	121	86.68%	10.52	159	83.60%
IIIC	12.70	57	86.81%	12.53	96	85.23%
IVA	14.78	154	87.71%	14.89	251	86.61%
IVC	18.62	21	87.88%	20.05	22	88.27%
VA	20.83	29	87.45%	22.38	29	88.74%

To.F. = total face.
Bizygo. = bizygomatic.

TABLE VI

RELATIVE AVERAGE DIMENSIONS OF FACE DEPTH (GONIOMENTON) AND FACE WIDTH (BIZYGOMATIC)

STAGES	MALES			FEMALES		
	AGES	NO.	G.M.×100 / BIZYGO.	AGES	NO.	G.M.×100 / BIZYGO.
IIA	5.53	13	63.44%	5.53	11	64.22%
IIC	7.69	12	64.08%	6.67	9	66.11%
IIIA	9.00	69	66.98%	8.40	72	66.54%
IIIB	10.91	85	67.37%	10.52	106	66.12%
IIIC	12.70	53	68.93%	12.53	47	66.80%
IVA	14.78	104	68.98%	14.89	145	67.35%
IVC	18.62	19	69.74%	20.05	19	70.58%
VA	20.83	27	69.95%	22.38	21	69.93%

G.M. = goniomenton.
Bizygo = bizygomatic.

tively deeper as it grows larger, because it increases relatively more in depth than in width. But in this respect the face of the male has a slight advantage over that of the female; i.e., the males become slightly more deep-faced, while the females become relatively more long-faced.

Changes in proportion are also noticeable when comparisons are made of dimensions in the same plane but at different levels. For instance, if the vertical increments of the ramus are compared with those of total face, some interesting features appear. Thus, if we examine the relative growth of

ramus height to total face height in females as it is expressed on a percentage scale in Table VII, it will be noted that there is a relative decrease between the ages of 5.5 and 10.5 years, followed by an increase to 22 years. But it should also be noted that the increase does not exceed its initial proportion of 45.5 per cent. In the male face the situation is somewhat different. There is, for instance, a relative increase in ramus height from 5.5 to 7.7 years. This is followed by a relative decrease to 12.7 years, after which there is again an increase. But at the end there is a net gain of 7.5 per cent in the relative height of the male ramus above the initial point. This indicates that the relative dimension of the ramus in height as compared with total face height is the same in adult females as it is in infancy. But in males the ramus becomes relatively larger as the face reaches adulthood. Moreover, it should be noted here again that *the relative increases of ramus height take place after stage IIIC, when the permanent second molars begin to erupt.*

TABLE VII

RELATIVE AVERAGE DIMENSIONS OF RAMUS AND TOTAL FACE HEIGHTS

STAGES	MALES			FEMALES		
	AGES	NO.	RA.H.×100 / TOTAL F.	AGES	NO.	RA.H.×100 / TOTAL F.
IIA	5.53	11	46.05%	5.53	6	45.31%
IIC	7.69	9	48.49%	6.67	8	45.16%
IIIA	9.00	69	46.01%	8.40	43	44.67%
IIIB	10.91	62	45.89%	10.52	49	42.88%
IIIC	12.70	40	45.34%	12.53	27	43.92%
IVA	14.78	121	47.14%	14.89	84	44.59%
IVC	18.62	15	49.93%	20.05	18	46.63%
VA	20.83	25	53.59%	22.38	18	45.54%

No. = number.
Ra.H. = ramus height.
F. = face.

TABLE VIII

RELATIVE AVERAGE DIMENSIONS OF BIGONAL AND BIZYGOMATIC WIDTHS

STAGES	MALES			FEMALES		
	AGES	NO.	BIG.×100 / BIZYGO.	AGES	NO.	BIG.×100 / BIZYGO.
IIA	5.53	17	70.20%	5.53	19	72.44%
IIC	7.69	13	71.23%	6.67	15	72.03%
IIIA	9.00	114	73.37%	8.40	107	72.71%
IIIB	10.91	122	73.48%	10.52	158	72.92%
IIIC	12.70	56	73.95%	12.53	68	72.27%
IVA	14.78	154	74.47%	14.89	252	73.47%
IVC	18.62	21	74.46%	20.05	22	73.42%
VA	20.83	29	73.41%	22.38	29	73.13%

Big. = bigonial.
Bizygo. = bizygomatic.
No. = number.

Changes in proportion are also to be observed in transverse direction. Comparisons of dimensions in width at different levels show similar effects upon the form of the face. Thus when the width of the mandible, at the mandibular angle (gonion), is compared with the width of the face (bizygomatic)—Table VIII, it is seen that, as growth progresses in width, the man-

dible becomes relatively wider than the face. But here again there is a sexual difference; i.e., the male mandible widens out relatively more than the female mandible. In other words, the male develops a broader jaw than the female.

TABLE IX

RELATIVE AVERAGE DIMENSIONS OF GONIOMENTON TO AURICULONASION DEPTHS

STAGES	MALES			FEMALES		
	AGES	NO.	G.M.×100 / A.NA.	AGES	NO.	G.M.×100 / A.NA.
IIA	5.53	13	89.33%	5.53	11	87.63%
IIC	7.69	12	89.09%	6.67	9	91.93%
IIIA	9.00	69	91.26%	8.40	72	92.95%
IIIB	10.91	85	92.24%	10.52	106	93.14%
IIIC	12.70	53	94.72%	12.53	47	91.95%
IVA	14.78	104	94.06%	14.89	145	93.34%
IVC	18.62	19	98.20%	20.05	19	91.05%
VA	20.83	27	97.40%	22.38	21	92.00%

G.M. = goniomenton.
A.Na. = auriculonasion.
No. = number.

TABLE X

RELATIVE AVERAGE DIMENSIONS OF AURICULOPROSTHION AS COMPARED WITH AURICULONASION DEPTH

STAGES	MALES			FEMALES		
	AGES	NO.	A.PR.×100 / A.NA.	AGES	NO.	A.PR.×100 / A.NA.
IIA	5.53	17	96.04%	5.53	19	93.92%
IIC	7.69	13	93.53%	6.67	15	94.73%
IIIA	9.00	114	97.65%	8.40	107	97.42%
IIIB	10.91	122	97.87%	10.52	158	97.69%
IIIC	12.70	56	98.28%	12.53	68	97.70%
IVA	14.78	154	98.50%	14.89	252	98.89%
IVC	18.62	21	100.93%	20.05	22	101.55%
VA	20.83	29	98.57%	22.38	29	100.00%

No. = number.
A.Pr. = auriculoprosthion.
A.Na. = auriculonasion.

TABLE XI

RELATIVE AVERAGE DIMENSIONS OF AURICULOINFRADENTALE AS COMPARED WITH AURICULONASION DEPTH

STAGES	MALES			FEMALES		
	AGES	NO.	A.IN.×100 / A.NA.	AGES	NO.	A.IN.×100 / A.NA.
IIA	5.53	16	92.11%	5.53	14	91.82%
IIC	7.69	12	92.53%	6.67	11	93.07%
IIIA	9.00	98	95.80%	8.40	96	94.84%
IIIB	10.91	106	96.05%	10.52	136	96.14%
IIIC	12.70	51	97.78%	12.53	60	95.89%
IVA	14.78	135	97.65%	14.89	210	98.53%
IVC	18.62	21	101.87%	20.05	21	103.39%
VA	20.83	28	99.67%	22.38	26	101.91%

No. = number.
A.In = auriculo-infradentale.
A.Na. = auriculonasion.

Another comparison is even more striking. For instance, if a comparison is made of the relative growth in depth at two levels of the face, very significant changes appear. As is shown in Table IX, in which the length of the

body of the mandible (goniomenton is expressed in percentages of the dimension from the ear hole (external auditory meatus) to the nasofrontal junction (nasion), the face increases its depth relatively more in the mandibular region than in the auriculonasion region. But here again it should be noted that this relative increase in depth is greater in males than in females.

In this series of comparisons there are two dimensions which are perhaps of more particular interest to the orthodontist. These are: the dimensions from ear hole to prosthion and to infradentale as compared with that from ear hole to nasion. As shown in Tables X and XI, there is a relative increase of these dimensions in the course of development. But, since prosthion and infradentale are the most anterior points in the curve of the alveolar arch, the relative changes indicate that the dentition in the course of facial development assumes progressively a more forward position in relation to auriculonasion dimension. But it should be emphasized that this forward position is relatively greater in females than it is in males. This sexual difference brings out the fact that females are more prognathous than males. The decrease in the relative dimension at VA will become clearer in the discussion of adjustment.

TABLE XII

RELATIVE AVERAGE DIMENSIONS OF UPPER FACE AND TOTAL FACE HEIGHTS

STAGES	MALES			FEMALES		
	AGES	NO.	U.F.×100 / TOTAL F.	AGES	NO.	U.F.×100 / TOTAL F.
IIA	5.53	17	61.25%	5.53	19	62.19%
IIC	7.69	13	61.50%	6.67	15	60.63%
IIIA	9.00	114	60.29%	8.40	107	60.65%
IIIB	10.91	121	60.85%	10.52	159	60.61%
IIIC	12.70	96	60.61%	12.53	68	61.08%
IVA	14.78	154	60.46%	14.89	251	59.75%
IVC	18.62	21	59.09%	20.05	22	59.14%
VA	20.83	29	59.94%	22.38	29	58.96%

U.F. = upper face.
F. = face.

TABLE XIII

RELATIVE AVERAGE DIMENSIONS OF LOWER FACE AND TOTAL FACE HEIGHTS

STAGES	MALES			FEMALES		
	AGES	NO.	L.F.×100 / TOTAL F.	AGES	NO.	L.F.×100 / TOTAL F.
IIA	5.53	17	33.65%	5.53	19	33.11%
IIC	7.69	13	32.30%	6.67	15	32.32%
IIIA	9.00	114	32.84%	8.40	107	32.04%
IIIB	10.91	121	32.38%	10.52	159	32.18%
IIIC	12.70	57	31.90%	12.53	68	32.44%
IVA	14.78	154	32.21%	14.89	251	32.15%
IVC	18.62	21	31.79%	20.05	22	31.21%
VA	20.83	29	32.16%	22.38	29	31.85%

L.F. = lower face.
F. = face.

Other changes in proportion which have hitherto not been sufficiently recognized become evident when relative changes of certain parts are com-

pared with changes of the whole. Thus, if the dimensional changes of the upper face height are expressed in percentages of the total face height (Table XII), the surprising fact is brought out that as the entire face increases in size, the upper face decreases its relative proportion, and this decrease is greater in the female. The same tendency, as shown in Table XIII, is also observed in the relative dimension of the lower face. This was somewhat puzzling to me. Since the dimensions of the entire face increase in the course of development and since also the dimensions of the upper and lower face increase, how is it that the relative dimensions of each decreased? It should be recalled that the dimensions of the face increase in two ways: (1) by growth of the upper and lower portions individually, and (2) by the development of the dentition between them. When therefore Table XIV is examined, the explanation is quite simple. As shown in this table, the increase in relative dental height makes up the discrepancy. This fact also brings to attention another relationship, that of the relative dimension of the lower to the upper face height. As seen in Table XV, there is on the average no change in the relative heights of these two dimensions. In other words, the ratio of the lower to the upper face dimension remains approximately the same throughout the entire course of development.

The changes in proportion in the course of development therefore bring about a relative lengthening and deepening of the face, as compared with its

TABLE XIV

RELATIVE AVERAGE DIMENSIONS OF DENTAL AND TOTAL FACE HEIGHTS

STAGES	MALES			FEMALES		
	AGES	NO.	D.H.×100 / TOTAL F.	AGES	NO.	D.H.×100 / TOTAL F.
IIA	5.53	17	4.59%	5.53	19	5.92%
IIC	7.69	13	5.56%	6.67	15	6.55%
IIIA	9.00	114	7.04%	8.40	107	7.02%
IIIB	10.91	121	7.20%	10.52	159	7.15%
IIIC	12.70	57	7.52%	12.53	96	7.30%
IVA	14.78	154	7.37%	14.89	251	8.06%
IVC	18.62	21	7.90%	20.05	22	8.63%
VA	20.83	29	7.30%	22.38	29	8.65%

D.H. = dental height.
F. = face.

TABLE XV

RELATIVE LOWER FACE HEIGHT AS COMPARED WITH UPPER FACE HEIGHT

STAGES	MALES			FEMALES		
	AGES	NO.	L.F.H.×100 / U.F.H.	AGES	NO.	L.F.H.×100 / U.F.H.
IIA	5.53	17	54.09%	5.53	19	53.24%
IIC	7.69	13	52.52%	6.67	15	53.31%
IIIA	9.00	113	54.47%	8.40	107	52.86%
IIIB	10.91	121	53.05%	10.52	158	53.10%
IIIC	12.70	57	52.63%	12.53	69	53.12%
IVA	14.78	154	53.41%	14.89	251	53.81%
IVC	18.62	21	53.80%	20.05	22	52.76%
VA	20.83	29	54.10%	22.38	29	54.05%

No. = number.
L.F.H. = lower face height.
U.F.H. = upper face height.

width. But the relative increases in length are greater in back (ramus height) than in front (total face height), while the relative increases in width and in depth are greater below (in the body of the mandible) than above (bizygomatic and auriculonasion). The relative dimensions of the upper and lower face heights become less when compared to total face height, the discrepancy being made up by the relative dimension of dental height. And finally, the alveolar arches gradually project more forward, as the dentition acquires its full complement of teeth.

2. ADJUSTMENT IN POSITION

In what way is the developing face affected by adjustment in position? This phase of differentiation, like that concerned with change in proportion,

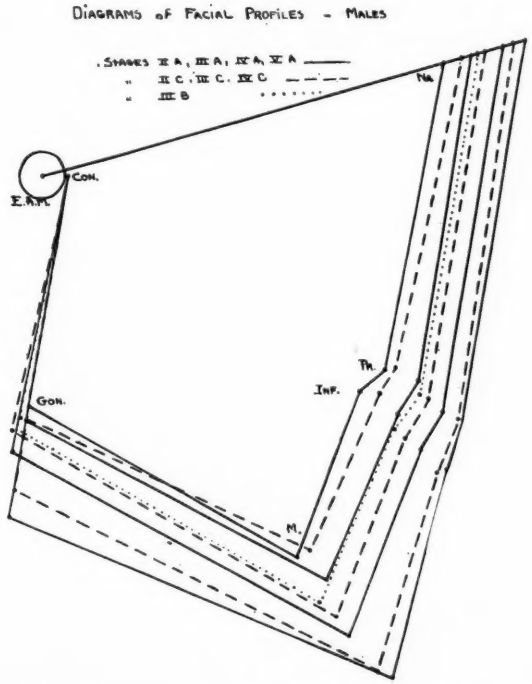

Fig. 1.—Diagrams of facial profile of males superposed on auriculonasion line, showing changes in growth and adjustment of face at various stages of development.

is brought about by differences of growth in two directions or by differences in increase of two dimensions. But, while changes in proportion are due to the effect of intensity of growth, adjustment in position is due to the effect of reciprocal growth. The two directions of growth chiefly concerned in the adjustment of the face are those in height and in depth. In order to explain this phase of differentiation more clearly it is necessary to resort to a different kind of evidence. A diagrammatic representation of the facial profile is of particular help. A diagram of this sort can be constructed of anteroposterior dimensions such as auriculo-nasion, -prosthion, -infradentale and -menton, which taken in the sagittal plane represent the profile projections of those points. Also goniomenton is used, but in order to have it appear in the form of a profile projection it is obtained by bisecting the triangle consisting of

bigonial width as the base and the two goniomenton dimensions as its sides. The dimension of the median thus gives the profile projection of the face in the region of the mandible. The vertical dimensions used in the diagram consist of total, upper and lower face heights, ramus height and dental height. Fig. 1 is a diagrammatic representation of the superposed facial profiles of boys at various stages constructed from the averages of the dimensions mentioned. The superposition, of course, is arbitrary and is made on the line representing the auriculonasion dimension.

Before discussing the meaning of this composite diagram, it is necessary to recall some facts already well known. Thus it is common knowledge that the centers of growth of the jaw bones are behind the dental arches. In the maxilla the center is represented by the tuberosity and in the mandible by the retromolar triangle. Furthermore, every one knows that at birth the alveolar arches in front of the tuberosities in the maxilla and the retromolar triangles in the mandible are just large enough to accommodate the anterior maxillary and mandibular eight teeth of the deciduous series. As the deciduous second and all the permanent molars are developing in their crypts, the jaws keep on growing around them to gain sufficient room for their accommodation in the dental arch. But, as growth takes place in the areas where the molars are to take their position, the part of the alveolar process bearing the teeth already present keeps on moving or adjusting itself forward. Coincident with the growth and adjustment the body of the mandible below also keeps on increasing its dimension from the angle to the chin. In the upper region too the dimension from the ear hole (external auditory meatus) to the nasofrontal junction (auriculonasion) is also getting gradually larger. While this growth and adjustment takes place anteroposteriorly, the face also increases its dimension vertically. In front there is an increase in size of the entire face mask and in back in the size of the ramus. Thus, by increasing in depth the face below the orbits really grows backward in direction and adjusts itself forward in position. Also because of unequal vertical growth which, as has been shown, is relatively greater in back (ramus height) than in front (total face height), the face adjusts itself forward more below, at the point of the chin, than above, at the root of the nose.

Fig. 1 is a diagrammatic presentation of the effect of growth and adjustment upon the changes of the average male face taking place from stage to stage. The solid lines indicate stages IIA, IIIA, IVA and VA, i.e., after the deciduous second, permanent first, second and third molars have erupted. It is obvious that at each of these stages a tooth has been added on behind those already present and that there has, at the same time, also been an increase in size of the jaw bones. But coincident with this there has been an increase also in the auriculonasion dimension and a forward migration of the entire face mask; the changes at the mandibular (gonion) are chiefly downward. It should, however, be noted that the angle shows slight tendencies also to shift backward. The meaning of this will be explained later. The broken line diagrams indicate the beginning of eruption of the molar teeth mentioned above. They indicate that growth had already taken place before the teeth

have begun to erupt and that it continues until they are fully present. The dotted line diagram indicates the stage (IIIB) during which no teeth are added on. At this stage the deciduous canines and molars are shed and are being replaced by their permanent successors. As shown, there was considerable increase in vertical dimension, but, since there was no addition in number of teeth, there has been hardly any increase in anteroposterior dimension, although it takes two years to attain this stage.

Fig. 2 presents the diagrammatic profile projections of girls' faces at the different stages. In this illustration the same features appear as in that for boys' faces. There are, however, some differences. It will be noted that in the dotted line diagram indicating stage IIIB when no teeth are added on, there is more growth in depth than in height of face. In the case of boys there was an increase only in height at this stage. It therefore appears that the

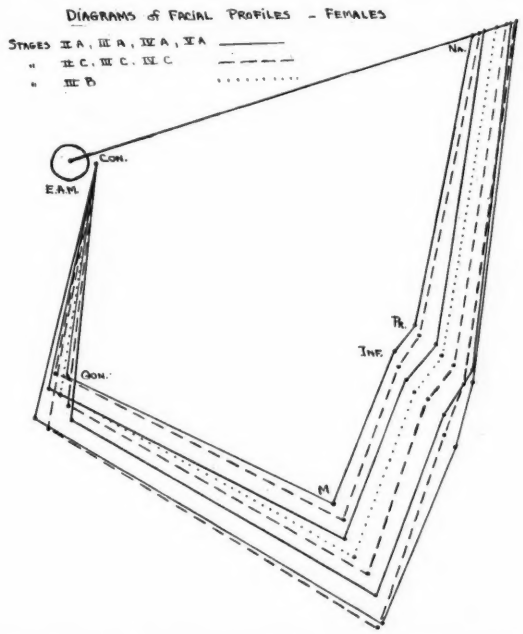

Fig. 2.—Diagrams of facial profile of females superposed on auriculonasion line, showing changes in growth and adjustment of face at various stages of development.

tendency of growth and adjustment in the faces of girls is somewhat different. It seems that either growth precedes adjustment or, vice versa, adjustment is just lagging behind growth. Whenever a disturbance of this sort occurs, it may be seen in the position of the mandibular angle (gonion). Thus, when growth has taken place and the face has not adjusted itself sufficiently forward, the position of the mandibular angle is displaced backward. In the females this seems to be quite characteristic. It may be that since the auriculonasion dimension increases relatively less in females than in males, the forward adjustment of the face is hampered. The evidence supporting this inference may be gathered from the fact that the auriculonasion dimension of the average female does not increase after the permanent second molars have completed their eruption (stage IVA). Growth of the jaws in depth is still taking place, because the third molars are still to be accommo-

dated in the dental arch. But, since forward adjustment either has entirely ceased or has been reduced to its minimum, the increase in dimension, as seen in Fig. 2, reverses the adjustment in position at stages IVC and VA. Instead of the chin moving forward, as is the case in the average male, the mandibular angle in the female is transposed backward, leaving the chin in the same position. By this manifestation it becomes quite clear that *there is a reciprocal effect between growth and adjustment.*

If it should be proved that a reciprocal effect between anteroposterior growth and adjustment of the face mask does exist, it will shed a good deal of light on the problem puzzling the orthodontist. The evidence so far cited is derived from mass studies and therefore based upon averages. What can be learned from studies of individuals? Fig. 3 illustrates the superposition of

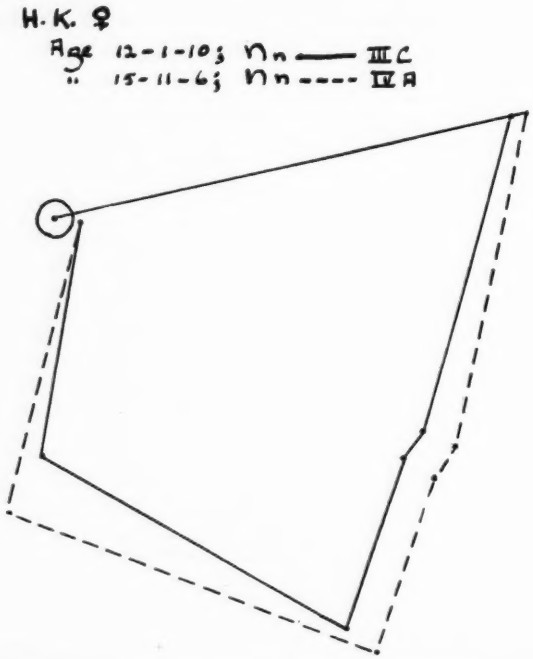

Fig. 3.—Diagrams of facial profile of girl superposed on auriculonasion line, showing changes in growth and adjustment at ages and stages indicated. Dentition in normal occlusion.

two facial profile diagrams of a girl's face with the dentition in normal occlusion. The one (solid line diagram) represents the face at stage IIIC when the permanent second molars were just beginning to erupt (at twelve years of age). The other (broken line diagram) illustrates the face four years later, some time after those molars were fully erupted (stage IVA). It is quite clear that the vertical and anteroposterior dimensions have increased, and that the face has adjusted itself accordingly. But it should be pointed out that, because of the lesser increase in the auriculonasion dimension, the face had adjusted itself more below than above, but that, since growth was more abundant below, it also has shifted the position of the mandibular angle in a backward direction. The greater increase of the ramus dimension over that of total face contributed to emphasize the greater forward adjustment of the chin and the downward migration of the mandibular angle.

More proof may be gained from the illustration in Fig. 4. The diagrams in this illustration present the facial profile of a boy at the ages and stages indicated. The dentition of this boy is also in normal occlusion. It should be noted that during the twenty months which transpired from the first (solid line) to the second (broken line) diagram, the dentition remained in the same stage (IIIA) of development. The auriculonasion dimension has increased considerably. The entire face has adjusted itself forward in conformity with this increase. But, as there was little growth in the jaw region, the angle has also adjusted itself forward. Three years and nine months later, all the second molars were fully erupted. Coincident with the acquisition of these teeth there has also been a considerable increase in depth and in height of the entire face. But at this time there was more growth in the mandible than in the auriculonasion dimension. There was also a relatively greater increase

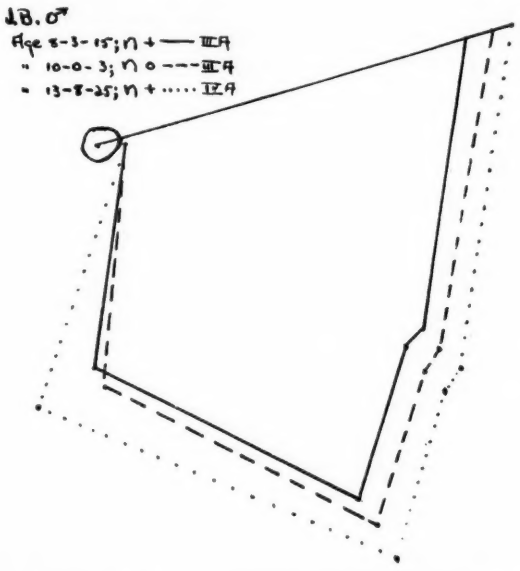

Fig. 4.—Diagrams of facial profile of boy superposed on auriculonasion line, showing changes in growth and adjustment at ages and stages indicated. Dentition in normal occlusion.

in ramus height than in total face height. The effect is that the face mask has adjusted itself forward in accordance with the auriculonasion increase. But, since the amount of growth of the jaw was greater, the mandibular angle has adjusted itself backward; due also to the greater increase in ramus height than in total face height, the mandibular angle has at the same time also shifted downward. In this, as well as in the foregoing illustrations, there is an important feature to be remembered, namely, that during the interval from stage IIIA to IVA there is a marked spurt of growth in both directions and considerable adjustment of the face. At this time the permanent second molars are erupting. It would appear as though this spurt of growth is of great significance to orthodontic procedure. Following, as it does, stage IIIB (not recorded in Fig. 4) when there is little or no growth, it is quite apparent of what help such a spurt of growth might be in the treatment of malocclusion of the teeth.

Still more evidence is furnished by the diagrams in Fig. 5. These diagrams represent the facial profiles of a boy with the dentition in normal occlusion at the stages indicated. Here too it is quite evident that in the year

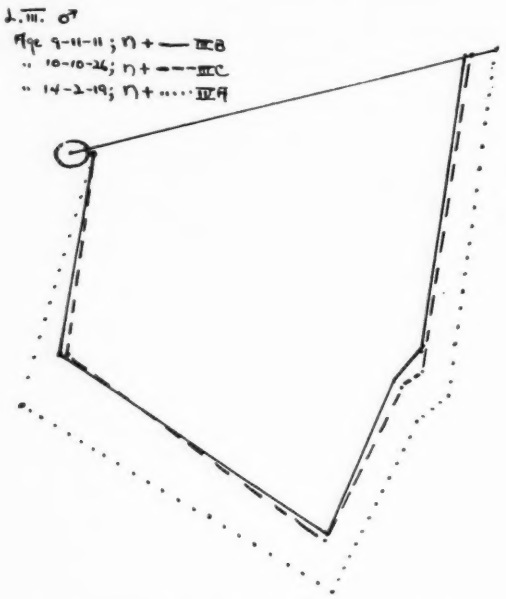

Fig. 5.—Diagrams of facial profile of boy superposed on auriculenasion line, showing changes in growth and adjustment at ages and stages indicated. Dentition in normal occlusion.

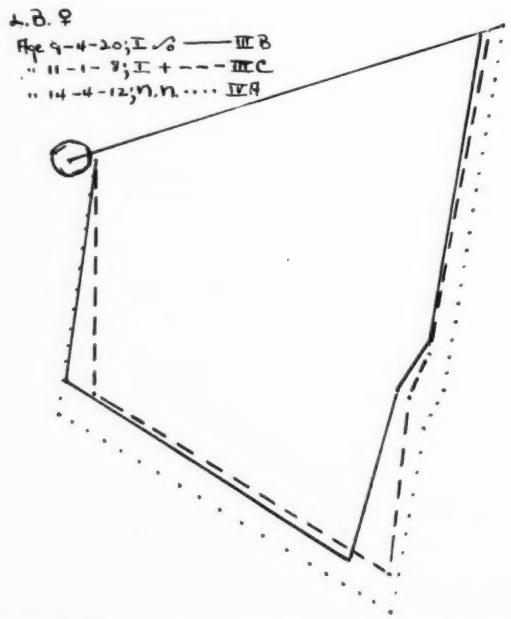

Fig. 6.—Diagrams of facial profile of girl superposed on auriculonasion line, showing changes in growth and adjustment at ages and stages indicated. Dentition in normal occlusion.

which transpired between the first two stages, there has been little growth but some forward adjustment. In the following three years and four months, however, there was an abundance of growth, both in height and in depth. But here again the growth of the mandible was greater than that from the

ear hole to the root of the nose, there has consequently also been a concomitant forward adjustment of the face mask and backward extension of the mandibular angle. Note again the spurt of growth and the stages of development. In contrast to this the changes taking place at the same stages in the face of a girl with the dentition in normal occlusion is shown in Fig. 6. As has been pointed out before, the auriculonasion dimension increases relatively less in girls than in boys when compared with that of the jaw bones. On that account, there is more spectacular display in adjustment in the mandibular region than there is of growth. Thus, as is shown in Fig. 6, the facial change from IIIB to IIIC is mainly in forward adjustment, but from IIIC to IVA there is forward adjustment corresponding to the auriculonasion

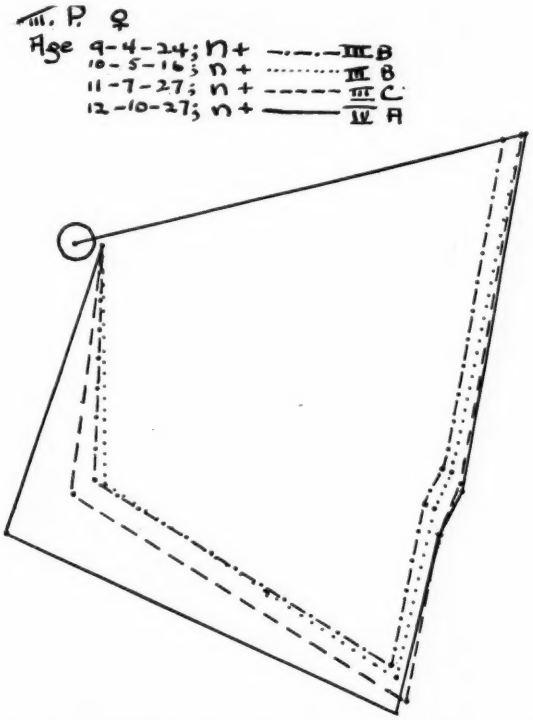

Fig. 7.—Diagrams of facial profile of girl superposed on auriculonasion line, showing changes in growth and adjustment at ages and stages indicated. Dentition in normal occlusion.

increments and backward growth. Finally, in Fig. 7 is given a detailed account of the phases of development of a girl's face from 9.5 to 13 years of age. Her dentition too is in normal occlusion. The stages gone through in the development of her face are IIIB, IIIC and IVA, the same as the girl before, but she was reexamined more frequently. The interesting features in the diagrams are the slight increase in the auriculonasion dimension during the stages indicated in the first two diagrams (dash-and-dot and dotted lines) and a concomitant forward adjustment of the entire face. There is then a complete cessation of increase in this dimension. With the beginning of eruption of the permanent second molars, IIIC (broken line diagram), there is more backward growth in the jaw region, but slight forward adjustment. When the

eruption of the second molars had been completed, there was no forward adjustment but considerable backward growth. Note again the stage and spurt of growth.

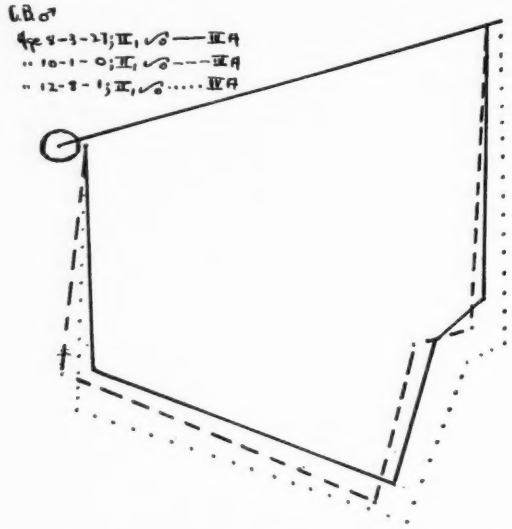

Fig. 8.—Diagrams of facial profile of boy superposed on auriculonasion line, showing changes in growth and adjustment different from those in Figs. 3 to 7. Dentition in Class II Div. 1 malocclusion.

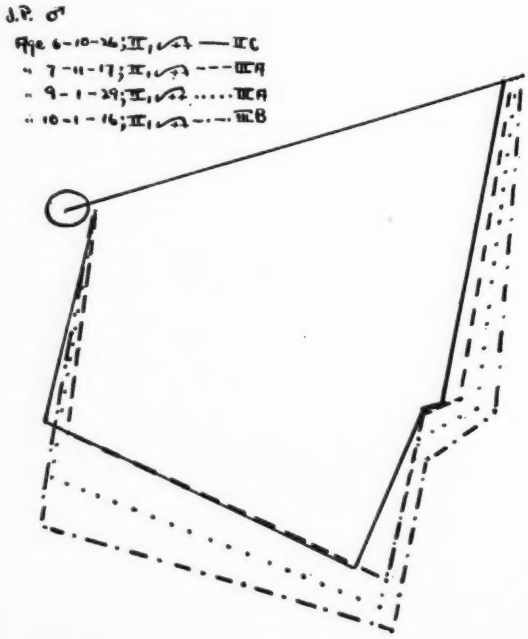

Fig. 9.—Diagrams of facial profile of boy superposed on auriculonasion line, showing changes in growth and adjustment different from those in Figs. 3 to 7. Dentition in Class II Div. 1 malocclusion.

Similar records of faces with dentitions in malocclusion present an entirely different aspect. In cases with Class II Div. 1 malocclusion, for example, the tendencies of growth and adjustment thus far observed seem to be disturbed. In Fig. 8 is represented the diagram of the face of a boy with the

dentition in Class II Div. 1 malocclusion. It is seen at once that, during the two-year period from eight to ten years of age shown in the solid and broken line diagrams, when the dentition remained in the same stage (IIIA), there has been some increase in vertical height but no increase in the antero-posterior dimensions. As was shown in Figs. 4 and 7, there is at this stage (IIIA) an increase in auriculonasion dimension and forward adjustment of the face. In this instance (Fig. 8) there is no such increase in dimension, and the accompanying adjustment (broken line diagram) is in the reverse direction. Thus, the face, instead of adjusting itself forward, has shifted backward. In the dotted line diagram, stage IVA, two years and a half later the face has grown but slightly above and considerably below. But the forward

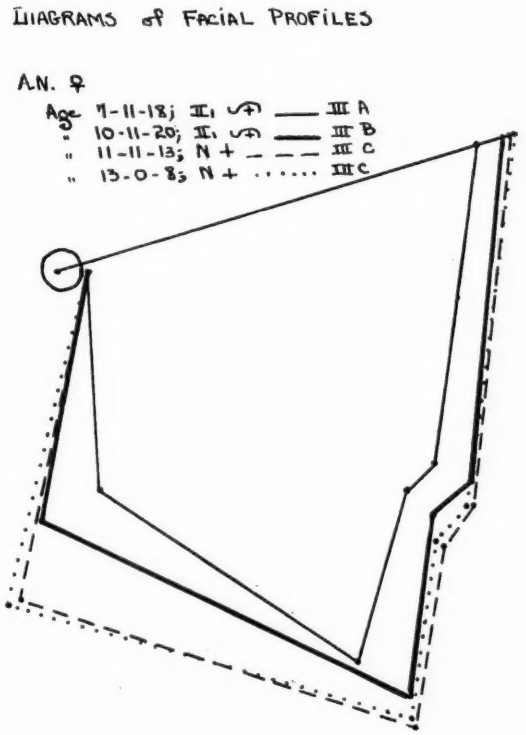

Fig. 10.—Diagrams of facial profile of girl, superposed on auriculonasion line, with dentition in Class II Div. 1 malocclusion before, during and after orthodontic treatment, showing changes in growth and adjustment due to mechanical stimulation.

adjustment is so extensive as to bring even the mandibular angle in a forward position. Another example is shown in Fig. 9. These diagrams are of the face of a boy also with the dentition in Class II Div. 1 malocclusion. This illustration too shows a reverse tendency in growth and adjustment. Thus, there is very little increase in the auriculonasion dimension throughout. There is, however, more growth in the maxillary and mandibular regions. But instead of this growth extending backward, the face adjusted itself in a more forward direction, the vertical growth contributing only to its elongation. It will be seen then that in the development of faces with Class II Div. 1 malocclusion the tendencies of growth and adjustment are different and the effect of reciprocal relationship is disturbed.

What is the effect of orthodontic treatment upon the tendencies of growth and adjustment in Class II Div. 1 cases of malocclusion? If, as we were taught, appliances are capable of stimulating growth, then the disturbances in growth and adjustment should be corrected by the establishment of normal occlusion. Well-recorded cases which were treated successfully fail to bear out this belief. Thus, Fig. 10 presents the profile diagrams of a face with the dentition in Class II Div. 1. The fine line diagram shows the face at seven years eleven months (IIIA). The heavy line diagram shows the changes which took place three years later (IIIB) without the aid of orthodontic treatment. There have obviously been abundant growth and considerable adjustment. Treatment was started then. The broken line diagram shows the facial profile one year later (IIIC) just as treatment was completed. With the exception of an increase in vertical dimension, greater in back (ramus height) than in front (total face height) and the slight increase in the auriculoinfradentale dimen-

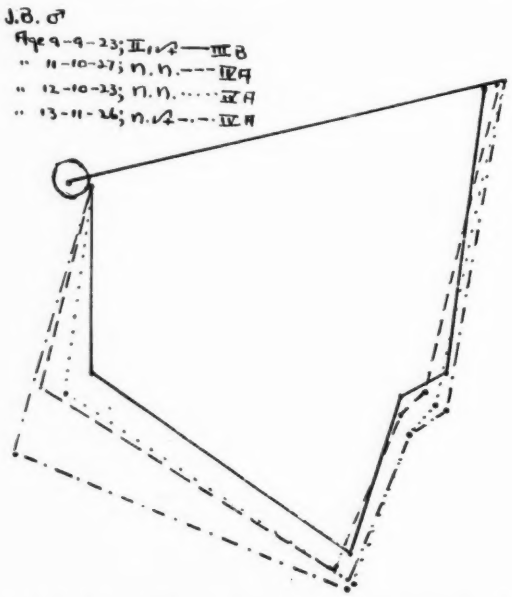

Fig. 11.—Diagrams of facial profile of boy, superposed on auriculonasion line, with dentition in Class II Div. 1 malocclusion before and after treatment, showing changes in growth adjustment due to mechanical stimulation.

sion, no other anteroposterior changes occurred either in growth or in adjustment, despite the fact that the teeth were brought into normal relationship. The dotted line diagram shows the face a year after treatment was completed. The changes are slight and consist of minute posterior adjustments. Has orthodontic treatment stimulated growth? If so, it is rather insignificant. In Fig. 11 are shown the profile diagrams of the face of a boy with Class II Div. 1 malocclusion. At nine years and nine months (IIIB) the appearance of the face is shown in the solid line diagram. Treatment was started then. A year later (broken line diagram) the teeth were in normal occlusion. As will be noted, the auriculonasion dimension has increased but very little; the growth of the body of the mandible was considerable. But, despite the forward pull on the mandibular dental arch exerted by the intermaxillary elastics, the mandible has grown and adjusted itself backward instead of forward as happens

when growth is so abundant and when the teeth are in normal occlusion. Moreover, instead of forward adjustment of the mandible, the maxillary alveolar arch seems to have been drawn backward. The effects of the force exerted by the appliances are quite clear. But while we speak of bringing the mandibular teeth and dental arch forward in "distoclusion" cases, it is just the opposite which happened in the treatment of this case. The dotted line diagram shows the face in forward adjustment. This happened during the year when the retaining appliances were worn. The dot-and-dash line diagram shows the face a year after all appliances were discarded. There was considerable growth in the ramus and downward shifting of the mandibular angle. Otherwise there was no other growth and but little forward adjustment at prosthion. It

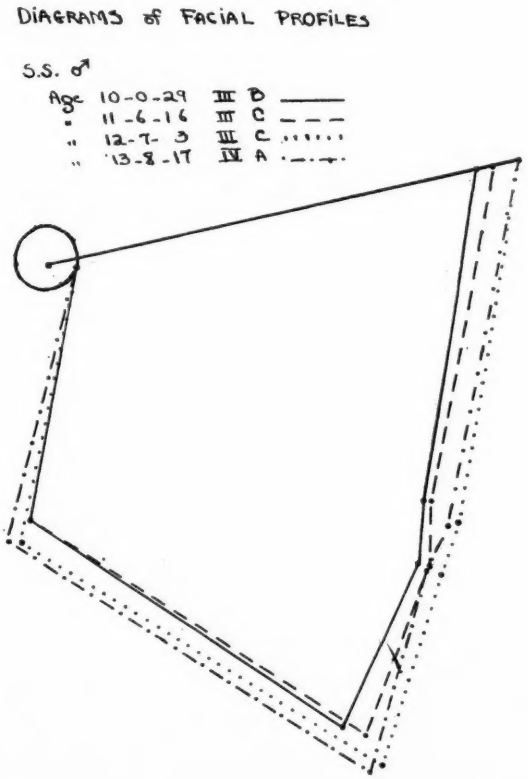

Fig. 12.—Diagrams of facial profile of boy, superposed on auriculonasion line, with dentition in Class III malocclusion before and after treatment, showing changes in growth and adjustment and the effect of mechanical stimulation.

would seem then that the characteristic growth and adjustment peculiar to cases with Class II Div. 1 malocclusion have not been altered. It might be said that if the treatment had an effect upon growth, it was in a reverse way.

In faces with dentitions in Class III malocclusion the characteristics of growth and adjustment are different. Thus in Fig. 12 the solid line diagram presents the face of a boy with Class III malocclusion at the age of ten years. One year and six months later the changes in his face are shown in the broken line diagram. No treatment had been resorted to. It should be noted that there was an increase in the auriculonasion dimension, less in the auriculo-prosthion and -infradentale, but more in the goniomenton. The adjustment was chiefly

in the mandible and in a forward direction. Treatment was started then. Thirteen months later there were significant changes. As shown in the dotted line diagram, there was considerable increase in the auriculo-nasion and -prosthion dimensions, less in the auriculoinfradentale and more again in the chin region. The great change was in the maxillary alveolar arch which was brought forward. Thus the tendency of growth and forward adjustment of the mandible continued, and the pull of the intermaxillary elastics helped to carry the maxillary alveolar and dental arches forward. A year later, as indicated by the dot-and-dash line diagram, there was no increase in dimension, but a change in adjustment which occurred in a backward direction.

That these tendencies of growth and adjustment cannot be altered by orthodontic treatment is further proved by the case presented in Fig. 13. The solid

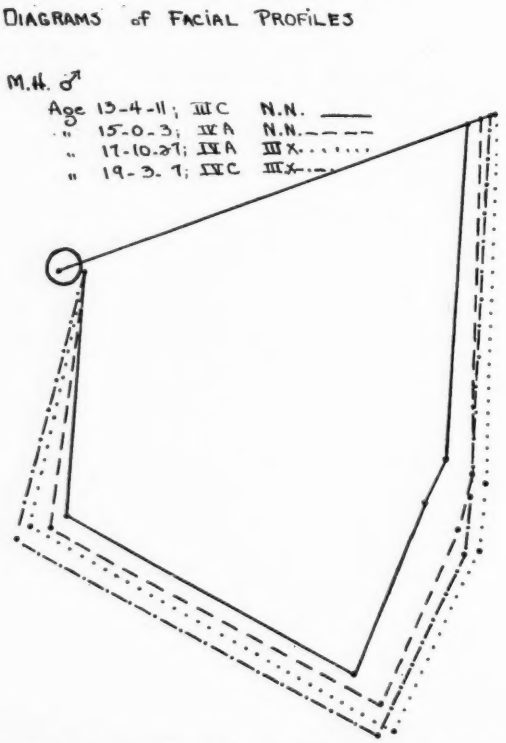

Fig. 13.—Diagrams of facial profile of boy, superposed on auriculonasion line, with dentition in normal occlusion after correction of Class III malocclusion, showing changes in growth and adjustment subsequent to orthodontic treatment.

line diagram shows the facial profile of a boy thirteen years and six months of age (IIIC) after the successful treatment of a Class III case of malocclusion. The dentition at this time was in normal occlusion, and the permanent second molars were just beginning to erupt. The broken line diagram shows the same face one year and six months later (at fifteen). The permanent second molars were fully present. As may be seen, there had been some increase in the auriculonasion, as well as in the auriculoprosthion dimension. The increase, however, is greater in the auriculoinfradentale and goniomenton dimensions. The facial adjustment was forward in the maxillary region but very much more so in the mandibular region. The teeth were still in normal occlusion. In the dotted line diagram the same face is shown three years later (at eighteen)

There has been an equal increase in the auriculonasion and auriculoprosthion dimensions, but again a considerably greater increase in the auriculoinfradentale dimension and in the size of the body of the mandible. The mandibular growth extends backward, but adjustment is also markedly forward. The dentition is now (five and one-half years after treatment) again in Class III malocclusion. It would seem then that, despite the successful orthodontic treatment, the tendency of growth peculiar to Class III cases has not been overcome. One year and four months later (dot-and-dash line diagram) when the third molars were just beginning to erupt, none of the dimensions increased: there was some adjustment, but in a backward direction.

SUMMARY

In summing up the evidence brought out in this paper, the following points may be emphasized:

1. The problem of malocclusion of the teeth has always been confused by methods of orthodontic procedure, but because of the multiplicity and complexity of appliances the task of solving the problems is now being supplanted by the problem of choosing appliances.

2. The teachings that malocclusion of the teeth is due to "arrested development," that arrested development is susceptible to mechanical stimulation, that orthodontic appliances are capable of stimulating growth, and that the treatment of malocclusion of the teeth influences the growth changes of the face cannot be upheld.

3. The evidence obtained from the study of 1196 series of measurements of external dimensions of the face in growing individuals from five to twenty-two years of age points to the fact that development of the face is a natural process and takes place regardless of orthodontic treatment.

4. From the available evidence it is quite clear that there are two phases concerned in the development of the face. One has reference to growth and the other to differentiation; growth being indicated by increase in size and differentiation by change in proportion and adjustment in position.

5. During growth the face increases its dimensions in three planes: vertically (in height), transversely (in width), and anteroposteriorly (in depth).

6. The transverse dimension of the face is greatest, the vertical is next in size, and the anteroposterior is smallest.

7. During growth the largest dimension (width) increases least, the intermediate (height) more, and the smallest (depth) most. All dimensions are larger in the face of the male.

8. When the face increases in width and depth, it does so more below, in the mandibular region, than above, in the bizygomatic and auriculonasion regions. When it increases in height, it does so more in back, at the ramus, than in front, as indicated by the total face height. These differences are more emphasized in the growth of the male face.

9. During differentiation the face changes in proportion, becoming longer and deeper in comparison with its width; the female face becoming relatively longer and the male face relatively deeper.

10. The changes in proportion of the three planes at different levels are greater in relative increase below in width and depth, and greater in relative increase behind in height. The changes are more marked in the male than in the female face.

11. The alveolar and dental arches project progressively more forward, the female surpassing the male.

12. The relative dimensions of the upper and lower face heights decrease when compared to the total face height, the dental height making up the difference; but the ratio of upper to lower face remains the same throughout the course of development.

13. Adjustment in position is brought about by differences of growth in height and depth, there being a reciprocal relationship in faces with dentitions in normal occlusion.

14. The tendencies shown in adjustment indicate forward growth and adjustment of the auriculonasion dimension and backward growth and forward adjustment of the jaw bones and alveolar arches.

15. During the addition of each molar tooth, beginning with the deciduous second and terminating with the wisdom tooth, there is an accompanying increase in the size of the jaws and a forward adjustment of the entire face.

16. In faces with dentitions in normal occlusion the growth and adjustment are reciprocal in character.

17. In faces with dentitions in Class II Div. 1 and Class III malocclusion the tendencies of growth are changed, and the reciprocal relationship is disturbed.

18. Orthodontic treatment of Class II Div. 1 and Class III cases of malocclusion influences the position of the teeth, their occlusal relationship and the probable adjustment of the alveolar arches. The tendencies of growth peculiar to these types of occlusion do not seem to be changed, because they persist for long periods after the culmination of orthodontic treatment. Other disturbances in growth and proportion are now in the course of investigation and will be reported at some future occasion.

In view of this evidence, only a small sample of which it is possible to present on occasions of this sort, the important facts emerge that the occlusion of the teeth may be regarded as a symptom of the development of the face, that the actual cause of malocclusion is not known, that disturbances in growth and adjustment are closely associated with malocclusion of the teeth, that inherent tendencies of facial growth are not altered by the changes in the occlusion of the teeth; and that successful orthodontic treatment depends upon the adjustment of the proper measures to the inherent tendencies of growth. It is therefore evident that the responsibilities of the orthodontist must assume a far greater significance if we are to keep in step with the trend of the times. If the duties to our patients demand that we assume the responsibility for the outcome of their dentitions, a well-planned supervision of the development of their teeth, jaws and face cannot be avoided. It should at this time be realized that a reliable diagnosis of malocclusion of the teeth is not possible by just one glance at the patient, especially when it is to be made in the course of development. If our opinions and decisions are to be of any conse-

quence, they must rest upon more information than is revealed by the occlusion of the teeth at one particular instant, when the course of development is so jammed full of events. The concluding remarks of Professor Gesell's report to the White House Conference on Child Health and Protection points the way for the orthodontist to follow:

"It should be emphasized that the accuracy and the hygienic," I would also add prophylactic, "value of developmental diagnosis are greatly increased by periodic and follow-up examinations. Too much confidence must not be placed in a single developmental diagnosis or a single inventory. The estimate of the individual's make-up and his growth potencies should be determined by a series of examinations in which each becomes a check upon all the preceding.

"After all, it is not the status at a given moment, but the growth characteristics of the individual career which are important from the standpoint of child health and protection. Periodic diagnosis then becomes the basis for developmental supervision."

More specifically: since 1925 I have been taking an inventory of the development of the patient's face, jaws and teeth as early as I can. This inventory is repeated at yearly intervals, or at intervals according to the stages of development outlined. By this procedure I learn something about the tendencies of growth of the individual patient. I then arrange for quarterly examinations to check up and keep tab on the development of the dentition and the changes in occlusion. During these examinations, height and weight of the patient are taken to check up on the general growth, attention is given to the general aspect of mouth conditions, to the shedding of deciduous teeth and to the eruption of the permanent teeth. Recommendations are then in order, if necessity arises for certain deciduous teeth to be retained or removed, or for certain spaces to be left alone or taken care of and of various exigencies that may arise. Since I began to follow this routine, I have often been surprised to find that some dentitions which seemed to be in malocclusion at one time have improved at another time. I have even found that such changes in occlusion are at times so marked as to obviate the need for orthodontic treatment. I get a certain moral comfort out of this, because I feel that I have given the child a chance to develop without interference.

When, however, I do find that orthodontic treatment cannot be avoided, I try to adjust the time of mechanical interference to the period of most active growth. In the case of girls this period begins at stage IIIB; in boys at stage IIIC. Since I have been adjusting the mechanical procedure to this time schedule, I find the results more satisfactory, more quickly attained and less liable to relapse.

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DISCUSSION

Dr. C. C. Howard, Atlanta, Ga.—It is evident that our heritage of so-called principles relating to etiology of perverted jaw and arch growth was founded upon the mechanistic viewpoint. It is also evident that the mechanistic viewpoint fails to coincide with facts born of statistical investigation and sensible observation. Nor does such a viewpoint satisfy our present knowledge of the biologic aspect of the pnenomena of life processes.

Now that we have passed the mechanistic stage of our evolution and have begun to apply biologic interpretations to our problem, we embrace a much wider knowledge. We are, as I see it, approaching a reality. We are beginning to catch within our own web the significance of a genetic influence upon both form and function.

We have been given evidence by Dr. Hellman which substantiates the theory that "the normal of biology is an individual normal and not a statistical normal. . . . In different individuals of the same species the normal activities of life are appreciably different, and what is normal to one may not be so to another." (*The Philosophical Basis of Biology* by Professor J. S. Haldane.) If the significance of this quotation were made the basis of future orthodontic teachings, our status as a scientific endeavor would be materially enhanced.

It is not a departure for me to agree with Dr. Hellman as to the influence of inherent growth impulses upon jaw and arch form. Surely no one here would question my disagreeing with those who advocate the potency of mechanistic control of growth of the bony structures of the face, because all of my previous discussions and humble efforts in literature have dealt with jaw and arch growth correlations.

Observation and a sincerity of interpretation are indispensable agents to progress. Statistical investigation is essential in establishing an expectancy, but it must be agreed that *expectancy* should never be confused with *certainty*, as *certainty* would contradict the very basic acumen of biologic science. I quote from Stockard: "One premise we may depend upon, namely, that all structural form in animals results from a process of unequal growth. Growth equal in all directions from the original spherical egg would perpetuate the spherical shape. . . . Certainly from the time of birth numerous growth-affecting substances are being produced in the body, the action of which regulates and modifies the rate and type of growth, their usual effects being simply to increase or decrease the rates of metabolism and thus to cause the individual to grow faster or slower."

My own investigation substantiates Stockard's premise which opposes the idea that growth is rhythmic. I have earnestly attempted to show that growth problems of the jaws and arches should be attacked during a period of accelerated spurts of inherent growth.

Observation of the difference in behavior of two cases of similar malocclusion should justify the weakness of the mechanistic viewpoint in stimulating the growth of living parts. With identical mechanical therapy applied to both cases, the difference in behavior of one to the other is often an astonishing contrast.

I have no fear of successful contradiction in sponsoring the theory that the skeletal make-up proceeds in irregular spurts of growth; that the long bones of the body have a rate of growth not parallel with the torso bones; that the osteogenetic rate of the hand is dissimilar in each individual; that the growth rate of the cranium is dissimilar to that of the face of the same individual; and, finally, that the maxilla and mandible are subject to inharmonies of growth explaninable by retarded or accelerated growth hormones and not by the mechanical influence of tooth relationship.

In my opinion, the outstanding lesson taught in this scientific presentation is: "It should at this time be realized that a reliable diagnosis of malocclusion of the teeth is not possible by just one glance at the patient, especially when it is to be made in the course of development. If our opinions or decisions are to be of any consequence, they must rest upon more information than is revealed by the occlusion of the teeth at one particular instant, when the course of development is so jammed full of events." I adopted such logic some ten years ago, and the information accrued therefrom constitutes, what I consider, the most valuable portion of my orthodontic education.

In studying Dr. Hellman's paper, I encountered no conflict in substance as related to his methods of study or his conclusions based upon his statistical findings. I do, however, fail to comprehend in a satisfying manner his use of the word "adjustment" and its exact relation to growth. I should be pleased to have him explain by some commonplace illustration the exact significance of the term "adjustment."

In closing, it appears from the history of the progress of all science that when error blocks the way a new light gives forth a shaft of truth which shows a better path to further advancement. I wish Dr. Hellman to feel that he has appeared before a most appreciative audience and that the philosophy of today's presentation will live and grow and take its place among the other jewels of his own creation.

(A number of slides were employed in substantiating the general theme of Dr. Hellman's paper.)

A COMPROMISE TREATMENT WITH THE EXTRACTION OF THE PERMANENT SECOND MOLARS*

RAYMOND L. WEBSTER, D.M.D., PROVIDENCE, R. I.

THIS case is one of a boy, aged thirteen years, with the following history: Tonsils and adenoids removed at three and one-half years, following a mastoid operation, respiration normal, and no history of habits past or present. While the general health at this time was good, the dental development would indicate that during his early childhood there had probably been many inter-

Fig. 1.

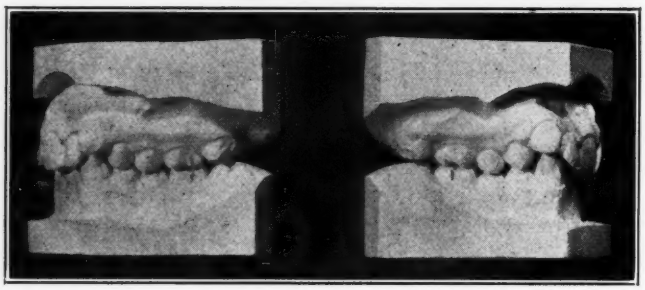

Fig. 2.

ferences with a normal metabolism. The dental arches were in neutroclusion, with a mesial drifting of the maxillary buccal teeth, with the resultant labioversion of the maxillary canines. The profile was very good, and in outlining the treatment I laid emphasis on the fact that nothing should be done which might disturb it. I regret that no photographs were taken, as my office was not equipped at that time to make this valuable record, which is our present-day procedure.

*Read before the New York Society of Orthodontists, New York City, November 15, 1932.

Fig. 1 shows the models of the case taken at the institution of treatment in October, 1929, and you will note the saddle-shaped maxillary and mandibular arches.

Fig. 2 shows the mesial inclination of the maxillary buccal teeth, but Fig. 3, nevertheless, shows an almost distal inclination of the second molars in both arches, also note the third molar positions.

Fig. 3.

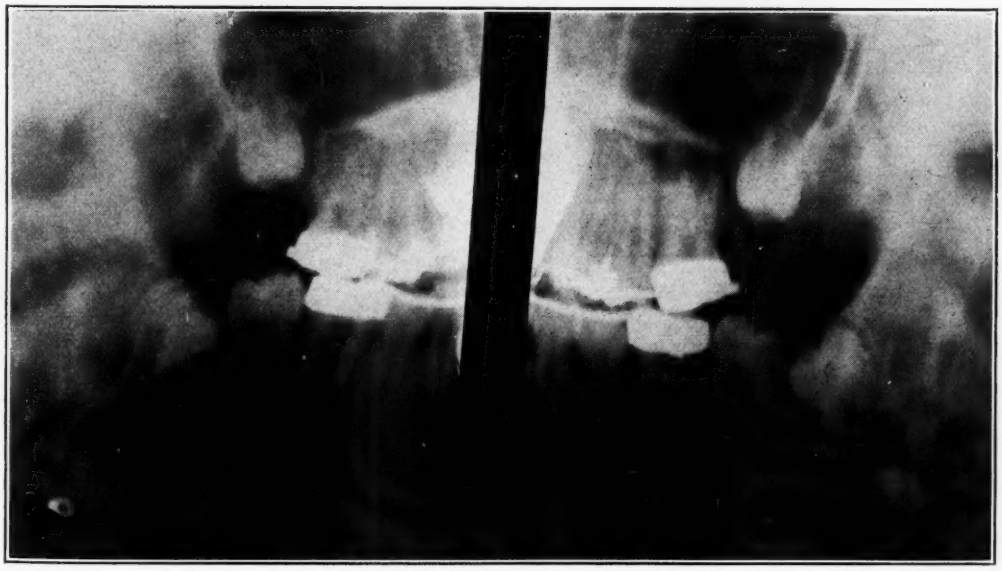

Fig. 4.

In outlining the treatment it was felt that at the patient's age it would be impracticable to endeavor to bring about sufficient lateral development of the maxillary arches to accommodate the teeth. In considering extraction one would usually consider sacrificing the first premolars, but I felt that a better

result could be brought about with the extraction of the maxillary second molars, to be followed by an appliance treatment restoring the maxillary first molars, premolars and canines distally, to their normal upright mesio-distal relation with the mandibular arch. This treatment, it was felt, would also relieve the threatening impaction of the maxillary third molars. The maxillary second molars were therefore extracted, and treatment was started. A ribbon appliance was placed on the maxillary arch and a removable lingual

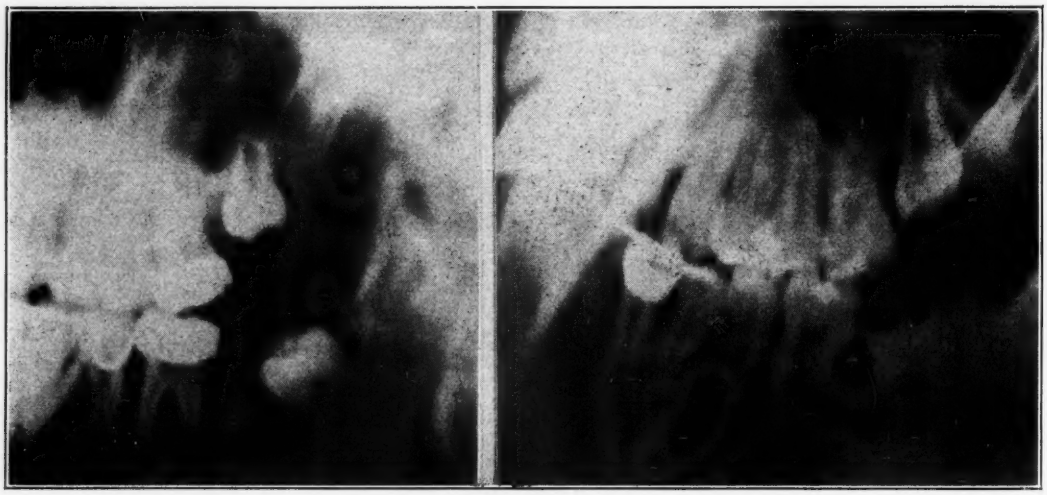

Fig. 5.

Fig. 6.

on the mandibular arch using intermaxillary anchorage. Along with the tooth movement as outlined the appliances were adjusted to bring about considerable lateral development in both arches.

Fig. 4 shows x-ray pictures of the case taken in April, 1930, seven months later. There was so much improvement in the positions of the maxillary third molars, while the mandibular condition in this area certainly did not show any improvement, that it was then felt that a similar procedure should be

considered in the mandibular arch, and the second molars were extracted in August, 1930, four months later, upon the patient's return from a summer's vacation.

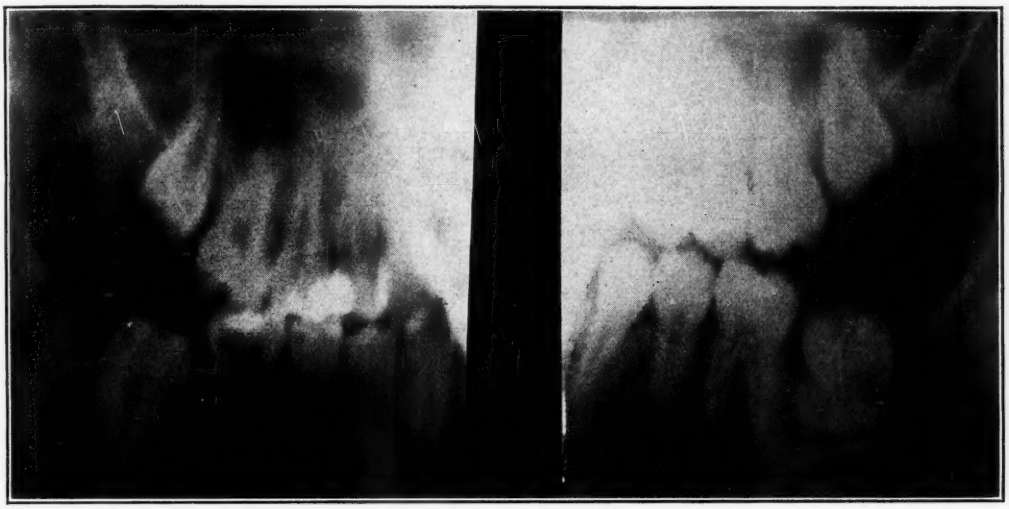

Fig. 7.

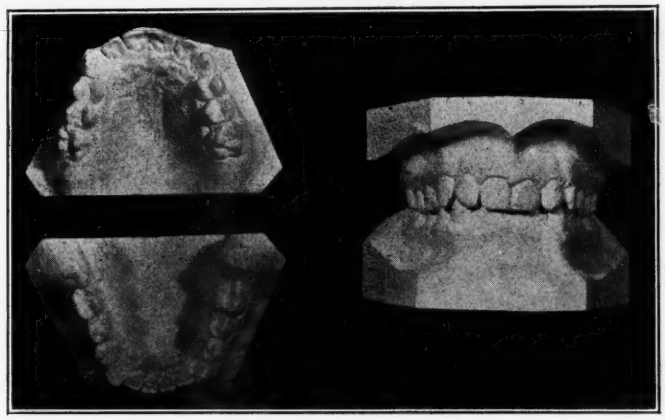

Fig. 8.

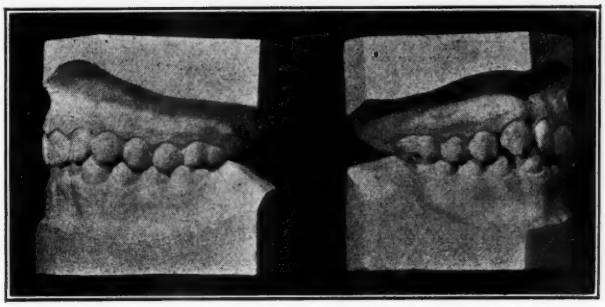

Fig. 9.

Fig. 5 shows x-ray pictures of the right side taken a year later, in May, 1931, and again in May, 1932, and Fig. 6 shows a similar condition on the left.

You will note the great improvement which was taking place in the third molar regions. At this later date all active appliances had been removed and a fixed lingual appliance was in place on the mandibular canines.

Fig. 7 shows the last x-ray pictures taken a few days ago, showing still a little more improvement in the third molar area, and while I cannot as yet show you the finished case, it is my opinion that a very good molar relation will result.

Fig. 10.

Figs. 8 and 9 show the models of the teeth as they are at present, three years after the institution of treatment, and Fig. 10 shows the photographs just taken of the young man.

In summing up this case the points which dictated the treatment to be given were as follows: First, the age of the patient; second, the facial outlines; third, the inclination of the buccal teeth and the positions of the third molars; and last, the prognosis.

CARCINOMA OF THE JAWS*†

CONRAD C. GILKISON, D.D.S., CLEVELAND, OHIO

CANCER of the mouth differs from cancer of the other parts of the body in several ways, all of which are favorable to a better prognosis than in cases of malignancy located elsewhere. In the first place, prophylaxis is possible in many instances; for some intraoral cancers may be prevented by better restorations or corrections of malposition or of irritation by carious or irregular teeth. Hence, cancers of the mouth are more likely to be preventable than cancers of the stomach, breast or uterus. In the second place, buccal neoplasms usually are in the direct range of vision and can be seen without extra illumination or any sort of a scope. Third, this easy access to the jaws and mouth makes the possibility of cure greater than if the lesion were more deeply seated. The resistance of the mouth to the invasion of bacteria also improves the prognosis. Last but not least, as a rule, patients show great concern over lesions of the face or jaws. Pain in the mouth causes the patient to seek advice sooner than the same degree of pain in the abdomen, back or sacroiliac region. Edema of the face alarms a patient much more than does the swelling of an extremity, and he continues to seek medical advice if the prognosis is not favorable. A patient is likely to make frequent inspections of the gums, teeth, tongue and mucous membrane with the aid of a mirror, with the result that intraoral lesions are brought to the attention of physician or dentist sooner than when the trouble is in some other part of the body.

In spite of these outstanding advantages, there are still between 3,000 and 4,000 deaths each year from intraoral cancer and probably many more that are not reported. Most of the responsibility of caring for these patients rests with the general practitioners of dentistry and medicine. They are the first to be consulted regarding any aberration or pain in the oral cavity.

Although there are some exceptions, most common malignancies of the jaws can be diagnosed very readily by biopsy, which is a simpler process than the extraction of a tooth. Every lesion of the mouth which fails to yield promptly to treatment should have a piece of tissue removed for microscopic examination. Stout[1] states: "It is quite generally agreed and understood that there is far more danger and risk to the patient by not confirming the diagnosis than there is a possibility of increasing the metastasis or growth of the lesion by cutting into it."

Some of the rapidly growing tumors require immediate attention and consideration; their progress will not be retarded while the dentist or physician is meditating on the case, and in very few months the tumor will have become inoperable. The progress of cancer in the soft vascular tissues of the mouth often

*From the Cleveland Clinic.

†This paper was read at the Inactive Duty Training Period of Military Dental Surgeons, Cleveland, Ohio, October 10-22, 1932.

is very rapid and in many cases is almost explosive. Even a few weeks may bring about many changes, and the growth may be transformed from a small local lesion to an infiltrating, ulcerating mass.

It is gross neglect to wait until epithelial lesions can be diagnosed by roentgenogram; they should be given immediate and thorough consideration.

Unless it is due to an extension from lip or cheek, carcinoma of the jaw is almost exclusively a disease of older persons. The sarcomas or connective tumors attack younger individuals. Carcinoma of the jaws is seen most commonly between the fourth and sixth decades, that is between the ages of forty and seventy years, and may be said to flourish in the decade from fifty to sixty years, while sarcoma selects youth and middle age. No age group is immune to these neoplastic diseases, and it appears that cancer has increased in frequency during recent years. However, this cannot be stated definitely because cases of this type certainly are being diagnosed with greater intelligence than they were a few generations ago. Carcinomas arise from epithelium, and in many instances come from the mucous covering of the gums or lining of the antrum. They are classified mainly by the kind of epithelium from which they grow; those arising from the surface are called squamous cell cancers, and those arising from glandular epithelium are adenocarcinomas. In the nose and accessory sinuses the normal ciliated epithelium may be replaced by squamous epithelium at the site of the cancerous growth and thus give rise to squamous cell carcinoma. All carcinomas of the jaws start in the epithelium of the mucous membrane or contiguous parts, and invade the bone secondarily. There is, of course, no primary carcinoma of the bone. A few cases of metastatic carcinoma of the jaws have been reported, but there is usually a surface lesion, although this may be quite small and also may be in some invisible area. Any swelling of the cheek or glands, any intraoral tumor and pain over the posterior maxillary ridge, especially if present in elderly persons, should cause suspicion of malignancy. Pain over the second division of the fifth cranial nerve may be due to many causes. Each of these should have thorough investigation before the teeth are extracted.

Next in importance to prognosis from the patient's viewpoint is the etiology, or the why of such a dreaded disease. All that can be said is that little or nothing is known regarding the true cause of cancer.

It is said that about one-fifth of all human beings are predisposed to cancer and that about 1 per cent of those who are predisposed actually have cancer. This means that in this country alone, 200,000 persons have cancer. In spite of the broad experience in dealing with cancer which this wide prevalence entails, the etiology or genesis of cancer remains an outstanding problem. Why should a cell which in its normal state grows and proliferates in an orderly manner, suddenly become subject to no laws and initiate processes which ultimately destroy the host? Countless theories have been proposed but none as yet can be accepted as the final answer.

Regarding predisposing factors much is known, but just which individuals are predisposed to cancer cannot at present be determined, though it is possible

that with the extension of biophysical and biochemical investigations some criterion may be established. Regarding such predispositions, Willy Meyer[2] has stated:

"The difference in the physical condition of the sites of predilection for and of comparative immunity from primary and secondary cancer would seem to reside in the respective degrees of activity of their circulation of blood and lymph, rapid circulation apparently going with immunity, sluggish circulation with seizure.

"On the chemical side of predisposition, I believe the genesis of cancer to be largely bound up with an unbalanced state of the salts of the serum. The development of sarcoma after trauma in a perfectly healthy person probably finds its explanation in the unbalancing of the salts of the serum by the trauma itself."

The findings by Dr. George Crile[3] that a precancerous condition, such as an x-ray burn, shows certain changes in electric conductivity, capacity and potential as compared with healthy tissue, these changes being in the direction of those shown by the cancer itself may lead to a biophysical interpretation of the genesis of malignant growths.

Any agent which is capable of causing death of the cells may be considered as a cancer-inciting factor, and may be bacterial, chemical or physical. Each of these agents may be assumed to act upon predisposed individuals by producing primarily a chronic irritation which in turn causes the irritated cells to cast off the normal trammels which limit their growth and proliferation. It is a significant fact in favor of this view that "the cancer cell was at one time a normal tissue cell, a cell of that particular tissue in which the cancer arises";[4] the fact that no external cancer has ever been observed to occur in a normal uninjured part; the fact that the many attempts to find a microorganism as the cause of cancer have thus far been fruitless; and the fact that the most potent method of inducing cancer experimentally is by the production of some form of irritation, for example on the external parts by painting with tar, on the intestinal tract by the introduction of intestinal parasites.

As to whether or not cancer is inheritable, all that can be said at present is that if anything is inherited it is some constitutional factor which produces a predisposition to the disease. According to Cheatle,[5] "Each type (of cancer) thoroughly investigated seems to depend in part at least upon constitutional factors which are inherited," and "the exact type of inheritance is complex and very likely is different in different types of cancer."

It is of interest to note that the incidence of cancer is practically the same in all countries in regard to both population and sex, while its incidence in various organs and tissues varies both geographically and according to sex. It is also significant that any living thing may have growths which are analogous to cancer. Erwin Smith found growths in plants which possessed all the essential characteristics of cancer in man as do malignant growths in the lower animals. Even in plants it has been shown that new growths result from continued irritation. According to W. J. Mayo,[6] a possible explanation of this effect of chronic irritation is that "when the tissues have been subjected to a

long-continued insult, the reparative processes are exhausted and, instead of healthy cells, less mature cells are thrown into the breach of continuity until finally embryonic cells are used to replace the normal epithelium.'' Most cancers appear after middle life when it may well be supposed that the cells have lost the reparative power they had in earlier years.

According to Crile[7]: ''If in the cancer period of life every unhealthy scar were excised and the surface covered by skin grafting, if every chronic irritation were removed, if every ulcer were healed soundly, or excised and the surface covered by skin grafting, if every wart and mole were excised, if the mouth were kept wholesome, the teeth smooth and even, it would be found that the problem presented by cancer of the outer surfaces of the body would be well-nigh solved.

''Since cancers obey one general law of growth, we may be sure that cancers of the inner, hidden parts follow the same course as do cancers of the skin. We must conclude, therefore, that internal cancers have their precancer stages—chronic irritation, ulcerative benign growths, etc. Thus in the larynx the precancerous state may be a syphilitic ulcer or a papilloma; in the stomach it may be a chronic ulcer; in the gallbladder, irritating gallstones and chronic inflammation; in the large intestine and rectum, ulcers and irritation from various sources; in the breast, chronic inflammation, benign tumors of certain types and senile changes; in the uterus, the irritation of pregnancy, senile changes, and benign growths; in the kidney and bladder, stones and benign growths.''

As for buccal cancers with which we as dental surgeons are principally concerned, the principal causative factors are syphilis, leucoplakia, tobacco and dental defects. The significance of syphilis is variously estimated. Meller[8] found syphilis to have been present in 3.3 per cent of his series, while Fournier[9] found it in 84.2 per cent. The potentialities of the prolonged presence of a syphilitic lesion should always be borne in mind.

According to Ewing[10] the effects of tobacco are as follows: ''The irritant effects stimulate the epithelium, produce chronic hyperemia, local erosions, lymphocytic infiltration, edema, and ulceration.''

As for the effects of an imperfect condition of the teeth Ewing says:[10] ''An imperfect condition of the teeth is directly responsible for many buccal cancers. The most obvious cases are those in which a projecting or ragged tooth continually abrades the edge of the organ, along the sides, or at the frenum. It is often difficult to detect the exact source of the effective dental irritation and it is often overlooked. An imperfect alignment of the teeth, a sharp, although smooth, edge, or chronic caries especially of the roots, pyorrhea, chronic alveolar abscesses, or the traumatism of extraction may be sufficient to incite a cancerous growth, especially in luetic smokers.''

With these facts in mind, dental surgeons should be constantly on the watch for these lesions which may be precancerous, and should also be quick to recognize malignant disease at the earliest possible stage.

The most outstanding advance in the treatment of carcinoma has come through the early recognition of the disease. With care and intelligence early diagnosis of cancer is possible and is one of the greatest possible services that can be rendered to the patient with malignant disease.

Following are two typical case reports:

CASE 1.—The patient was a woman aged seventy years, who presented herself at the Cleveland Clinic because of a lump on the right jaw. She always had been well, and had no complaints except the painless swelling which had first appeared five or six weeks before. All her teeth had been extracted ten years previously. At the first appearance of the swelling, the patient consulted a dentist, who cut down on the mass from the inside, in an attempt to find a dental root, but none was apparent. A physician treated the lesion with caustics for infection of the jaw. There had been no loss of weight, although the patient felt that her appetite was somewhat impaired. The only significant fact elicited in the personal and family history was that one brother had died from cancer of the liver.

The general physical examination revealed nothing of importance, except the hard, fixed mass in the mid-portion of the right mandible which could be

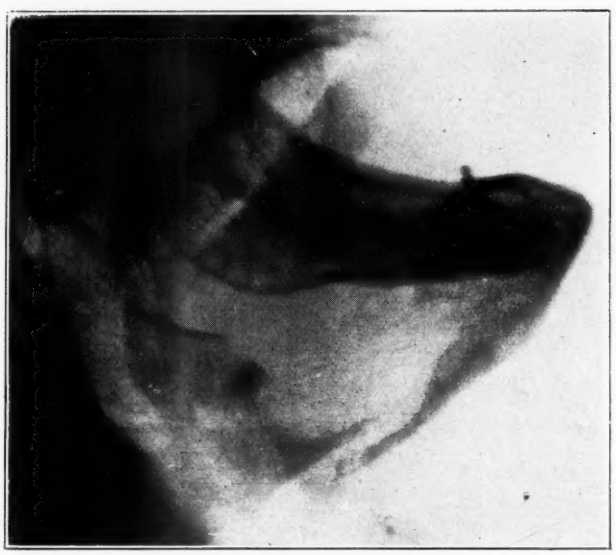

Fig. 1.—This lesion has destroyed the bone completely except for a thin layer of cortical bone on the under surface of the jaw. This has been fractured with some displacement and overriding of fragments. (Case 1.)

palpated externally. Inside the mouth was a red, firm irregular mass along the right jaw. Manipulation caused pain and showed that there was a fracture of the mandible.

The roentgenogram disclosed the presence in the right mandible of a destructive lesion, which had destroyed the bone completely except for a thin layer of the cortex on the under surface of the jaw, and this had been fractured with some displacement and over-riding of the fragments. The roentgenographic diagnosis was carcinoma of the jaw.

Radium seeds were implanted by Dr. Jones into the jaw, and the nerve was injected with alcohol for the relief of pain. This resulted in recession of the growth, and when the patient was seen a year later, she was in good condition, although there was evidence of recurrence which necessitated further irradiation with radium.

CASE 2.—The patient, a man aged sixty-nine years, for two months had noticed a gradually increasing stiffness of the right side of the tongue and of the jaw. This prevented opening his mouth wide, and there was a sensation of jerking and contraction on the right side of the mouth. He also had had paroxysms of pain in the right jaw. This pain extended over the entire right face and head to the exact midline of the scalp, and the area involved had become sore to the touch. The pain had been worse at night and had been severe enough to prevent his eating solid food.

The past history and family history were irrelevant.

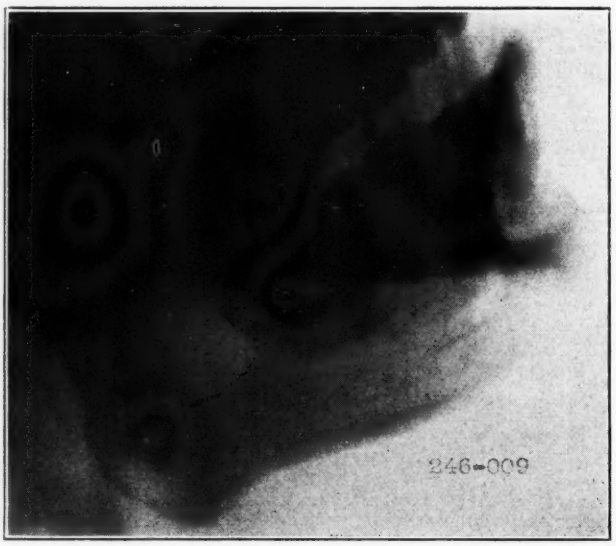

Fig. 2.—Destructive lesion in the right mandible opposite the angle. (Case 2.)

Fig. 3.—This intraoral roentgenogram shows clearly the destruction of the cortical bone. (Case 2.)

Aside from arteriosclerosis and obesity, the general physical examination showed nothing important. Examination of the mouth showed that the tongue was very dry and deviated slightly to the right. The teeth were in good general condition for a person of his age. There were stiffness and soreness of the right jaw, and lateral to the mandibular third molar was a small mass which was very tender, slightly ulcerated and very hard. A lymph gland beneath the right jaw was tender and showed slight enlargement, and there also was some swelling of the pharynx.

The roentgenogram showed an irregular, destructive lesion of the right mandible opposite the angle. A special dental examination revealed that the

mandibular right third molar was vital, although it appeared to be involved in the rarefied area. All teeth were present, and there had been no restorative work, and there were no deep pockets. There was some trismus of the jaws, probably attributable to the tumor.

The second and third right mandibular molars were extracted, and some granular tissue was curetted from the area of rarefaction. Dr. Jones treated the entire area at the angle of the jaw by electrocoagulation.

The pathologic diagnosis of carcinoma was made from a study of the tissue from the mandible, which included the mucosa of the alveolar border. The underlying tissue revealed a large area of ulceration, and beneath this, large and small masses of solid epithelial cells of the squamous type not forming glands or pearls, were lying in a rather dense, fibrous stroma.

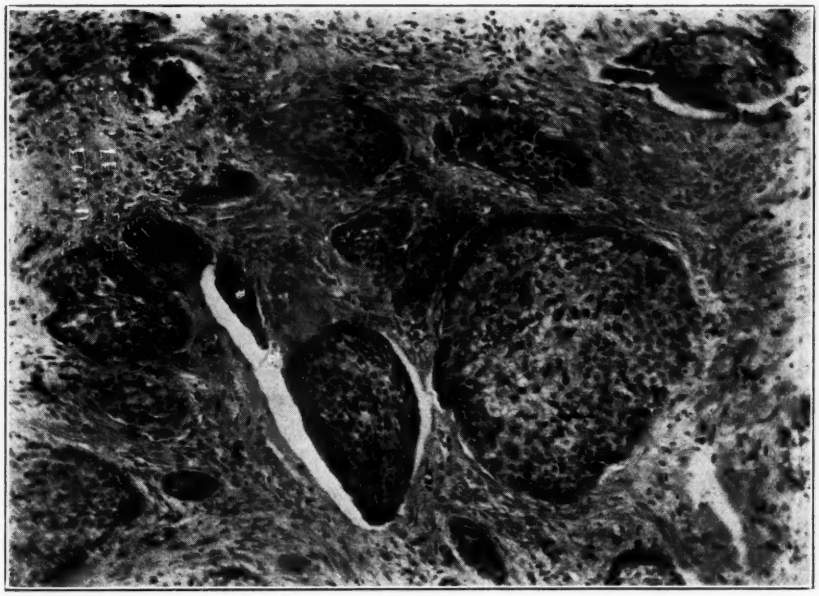

Fig. 4.—Large and small masses of solid epithelial cells of the squamous type not forming glands or pearls, lying in a rather dense fibrous stroma. (Case 2.)

These cases are presented purely from the diagnostic standpoint. They fall under classification of metastatic disease with metastasis by the lymphatics or by direct extension. Patients with carcinoma of the jaw should receive general surgical and general medical care.

Photographs of these patients revealed very little. In the first case there was definite destruction of cortical bone, typical of carcinoma.

In the second case, the destruction of cortical bone was on the lingual aspect of the mandible and did not give the typical roentgen picture of carcinomatous destruction, and might be confused with some other destructive lesion of central mandibular origin or of vascular origin.

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DEPARTMENT OF
DENTISTRY FOR CHILDREN

TO THE MEMBERS OF THE AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN

HAIDEE WEEKS, D.D.S., NEW ORLEANS, LA.

IN ACCEPTING the Presidency of the American Society for the Promotion of Dentistry for Children, I do so anticipating a great deal of pleasure. I know I shall have the hearty cooperation of not only the officers and committee chairmen but the members at large, of our organization. I want to assure you for all the officers, members of the Board and committees that we will do our part for the promotion of a successful year. As a chain is only as strong as its weakest link, how mortifying and disastrous it would be if we had a weak link.

We can follow no better example than that of our retiring President, Dr. Hyatt, who embodies all that is ideal in a leader, one who has shown that he has the courage of his convictions, and that courage for his ideal, dentistry for children.

Let me say that I cannot carry on the correspondence that Dr. Hyatt has so willingly done, because, although the heart is willing, the flesh is weak. On the other hand, it will not be necessary for so much correspondence, as Dr. Hyatt has so well continued to enlarge the foundation laid down by his predecessors that we will only have to make that foundation stronger by our cooperation in increasing the membership, and in that way paving the way for more dental care for children.

May I ask that every member acquaint himself with the Constitution and By-Laws. In so doing, he will have a better understanding of the organization. If some of us had been conversant with the Constitution and By-Laws, it would have prevented much waste of time and money last year, and prevented some of us taking exception to the papers and clinics which were given in Buffalo, for the first time, and which we later found to be perfectly constitutional.

May I suggest that you use your influence to have, in every dental society in the United States, a specific day for dentistry for children. Have a meeting with round table luncheon followed by a program. We had one in New Orleans in May at our Spring Clinic, which went over with a bang. Many men took part who had never before evinced any interest at all in the subject. Each member on the program wrote to the library of the Ameri-

can Dental Association for the latest and most scientific data on his subject. And I must say, not to boast, that it was as interesting and instructive as any meeting could be.

Let us set aside the month of May for such work, as May has for several years been given over to the child.

May I ask you who are doing clinic work not to do it only for the remuneration but to do it for the sake of science. Keep your records carefully, and, when in later years you revert to your records, you will be amazed and gratified beyond measure to see the realization of your dreams come true.

Will you not feel free, at all times, to give me your criticism, advice and counsel?

This is not *my* organization, it is *ours,* and it is only by concerted effort that we will attain the goal which we have set for ourselves.

Prevention is the greatest word in the world of science today, and that prevention starts with the small child. Every section of the American Dental Association, from operative dentistry to the morgue—oral surgery—owes its sins of omission and commission to the lack of preventive dentistry, and that, as we all know, is dentistry for children.

We must consider ourselves the preceptors of prevention, and let us see that the child is given the birthright that he rightfully deserves, and to which he is entitled, a perfect mouth.

COMMITTEE REPORTS GIVEN AT THE SEVENTH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN*

Report of the Committee on Publications

Immediately upon being appointed, we ascertained from Dr. F. B. Rhobotham, who was chairman of the committee for 1931-32, just what was accomplished and the ways and means for best succeeding.

Our main objectives for the past year were: (1) To acquaint every ethical dental publication in North America with the aims, hopes and purposes of our Society; (2) to urge the editors of these periodicals to write editorials relative to the importance of and necessity for children's dentistry, with especial reference to Child Health Day in May, when the interest is naturally and nationally centered upon the care and attention given the child; (3) to urge editors of the different state dental bulletins to publish articles on the many phases of children's dentistry and to try to interest these men and through them the respective state dental associations in having an essayist or clinician appear upon their program during the time of the annual meetings; (4) to urge all dental journals, dental bulletins and other large organized dental or public health groups to publish as many articles pertaining to children's dentistry as possible, we agreed to furnish such articles as original contributions if they wished them and called for them; (5) to assist all other committees of our Society to promulgate our principles, to accomplish their committee assignments better, to make this a most successful year in every respect, and to make the annual meeting in Chicago in August one of the best attended, most thoroughly practical and helpful, and most interesting and inspiring meetings we had ever held.

1. Every editor of an outstanding dental publication in North America was written to, some of them several times. The part of our Constitution and By-Laws telling for what we are organized was quoted, and every courteous request made that the cause of children's dentistry be given its rightful and appreciative place and consideration.

2. We promised to send the latest facts and resolutions to the editors; we suggested themes for editorial discourse; we told what other dental journals were doing for the cause; we stressed the importance of May and Child Health Day editorials.

3. The offer was made to editors of state dental society bulletins of short, comprehensive and appealing articles, resolutions and interesting data on children's dentistry for publication. A very earnest plea was made for them to stress the importance of and need for children's dentistry to their members, to try to gain through them the support of the state dental association in having appear upon every state dental association program a clinician or essayist on some phase of children's dentistry. We promised to send names of outstanding, capable, interesting clinicians and essayists who were in the closely approximating territory to their state group, men and women who could and would interest, help and inspire their members.

4. We succeeded in getting published more than twenty papers in seven different leading dental journals in America, because of our proffer to supply original articles to these journals. One journal, *The Dental Survey*, turned over to our committee the whole April issue of the publication for the cause of children's dentistry. *Dental Cosmos, Dental Digest, Oral Hygiene, Dental Summary, The American Dental Journal, Dental Items of Interest, International Journal of Orthodontia and Dentistry for Children, Dental Review, Journal of Dental Research, The American Journal of Public Health,* and *The Journal of the American Medical Association,* one and all promised and gave real indorsement, support and helpful cooperation by strong editorials, by able papers and clinical reports, and by eternally stressing

*Meeting held in Chicago, Ill., August 7, 1933.

our obligation and responsibility to the child in dentistry. We also were able to furnish to several state dental associations the names and addresses of leading members of our Society who in turn gave splendid papers and clinics on children's dentistry.

5. Our very capable and far-visioned president this year appointed a vast number of committees, all filled with enthusiastic workers for the cause of children's dentistry and the promulgation of our Society's aims and purposes. We helped give publicity to our annual meeting, to large meetings held for the cause of children's dentistry, for outstanding reports of our Society and last annual meeting in Buffalo, for the splendid work being done by certain children's dental study club groups, and lastly by immediately and promptly cooperating and assisting the Arrangement and Program Committees, Study Clubs, Research, Diet, State Societies, Membership, and the president and all other officers of our group. The publicity and reportorial work for this annual meeting was turned over to our committee by our president; we have striven earnestly to do all we could for the Society and the great cause we love and serve.

In conclusion, for my committee, I should like to thank publicly all editors, business managers and associates of the many dental journals and state dental society bulletins who so generously and encouragingly cooperated and helped our committee work. I sincerely wish to thank those faithful few who answered our many letters, who furnished information and original papers, who gave clinics and articles when urgently requested.

For the sake of any future group who may be assigned to work on this committee on publications may I implore the Society to furnish the committee chairman with sufficient funds to do his work well without financial cost to himself. May I beg you members to answer letters written to you, to make good on your promises after you have pledged them, to send articles, give clinics or do what you say you will do.

It has been a joy to work and serve you; we are glad of the progress we have made, of interest in children's dentistry, of improvements in technic and methods, of increase in membership, of the growing membership in numbers and research study. Many times during the year we have been downcast; we received hard knocks and bitter disappointments; but thanks to a few thoughtful members and friends, some roses were sent among the many thorns.

May the American Society for the Promotion of Dentistry for Children grow greater, be of more service and help to our profession at large, interest and imbue the dental colleges and universities with their great responsibility to teach children's dentistry to the students, encourage the many study clubs and state society groups, gain a larger place on state dental association programs, and continue to cooperate with the American Dental Association and all kindred related and interested groups in bringing to pass that day and time when the boy and girl will be given the attention, service and consideration which are rightfully theirs, of being healthy, happy and useful in body, mind and soul.

Respectfully submitted,

LOUIS F. TINTHOFF,
EDMUND T. GUEST,
JOHN E. GURLEY,
WALTER T. MCFALL, Chairman.

REPORT ON NATIONAL SURVEY OF DENTAL SERVICE FOR SCHOOL CHILDREN

The dental profession is gradually appreciating the value and necessity of preventive dentistry as particularly applied to children. Heretofore, public health agencies and the laity have been confronted with the problem of obtaining a conscientious service for children from private practicing dentists. The pendulum is beginning to swing in the opposite direction, probably due to present trends regarding adequate dental service for the masses, educational propaganda, commercial courses on dental economics and many other points of contact.

Now that the dental profession has seen the handwriting on the wall and is willing to render an adequate service for children, the one big problem is defining a policy agreeable to all concerned.

Boards of education need to be taught that without mouth health which is conducive to physical well-being, children not only are handicapped mentally and physically, but are financial liabilities to schools.

School appropriations are based upon the average daily attendance; consequently absences caused by all illness, including toothache, are responsible for decreased school funds, lowering morale of classes, and failing to meet all the laws of nature by not taking the opportunity to develop children with physical foundations comparable to that expected of the American people.

Children, as well as adults, are called upon now, more than ever before, to give more of themselves. They are expected to excel in their school work, they must compete in school athletics, be familiar with national sports, and must receive a cultural training which fits them to cope with the activities of the present standards of living. With the rapid development of a country such as ours, it is only natural that more is expected of the new generation. Is it not logical, then, to give the physical status first consideration because when not up to par, it limits all of the other requirements?

Realizing that dentistry for the prevention of dental defects is so much more beneficial than dentistry for the relief of pain, it seemed that the American Society for the Promotion of Dentistry for Chidren was the agency which should assume the initiative and take steps to try to point out the advantages of preventive dentistry.

For some time, private dentists and public health departments have been faced with the problem of the schools not allowing children to leave during school hours for dental care. Many school authorities think that appointments should be given after school and on Saturdays. Even if "after school" appointments were satisfactory, it would be impossible to see many patients during the few remaining hours of the day. The main objection to late afternoon appointments, however, is the difficulty the dentist encounters when attempting to render a good service for tired, restless children. Both the dentist and the patients have a better relationship when both are fresh and rested. Just the nature of dental work is sufficient to develop a nervous reaction in a great many instances; then with the added strain of a day's work, it is simply unreasonable to expect as good results as could be obtained under more desirable circumstances.

Taking these points into consideration, the President of this Society requested a national survey to determine general conditions after which a program could be developed.

The following letter and questionnaire were drafted and sent to all the state boards of education, including that of the District of Columbia:

January 18, 1933.

TO STATE DEPARTMENT OF EDUCATION—ALL STATES

My dear----------:

Education and health of children go hand in hand. We all recognize the fact that a good education is not as beneficial to the individual or the community without health; neither does education insure health, without which the power of learning and putting knowledge into effect is of little value.

The oral condition of the child plays a very important part in his health. Unless children's teeth are kept in repair, not only is their immediate or early health impaired, but permanent disabilities may result that last throughout life. In certain sections of the United States statistics have been obtained showing a high percentage of school absences because of toothache. "Prevention is better than cure," although a time-worn saying, still applies so forcibly in this regard that it bears repetition. *Preventive* dental care requires less time, less pain, less expense, a better dental condition and likewise, a resulting better physical condition, and lastly a better ability to study and progress in school.

The President of the American Society for the Promotion of Dentistry for Children has appointed me to make a national study relative to the existing policies permitting children to have dental care without being regarded absent from school.

The attached questionnaire is for the purpose of becoming familiar with the existing conditions in the United States. Your filling it out will help us materially in making general recommendations.

Thanking you for your cooperation, I am

Very truly yours,
HAZEL MERRICK, D.D.S.

QUESTIONNAIRE

Date: State:

DENTAL CARE OF SCHOOL CHILDREN

1. Are school children permitted to have dental care during school hours, without being considered absent, by a—

	Yes	*No*
Private dentist	----------	----------
School dentist	----------	----------
Health department dentist	----------	----------
Other clinic dentist	----------	----------

(Please check all that apply)

2. (a) If so, is an appointment card or note for the dentist required verifying child's appointment?---------- Do dentists cooperate?----------

(b) If not, would you approve allowing dental care for children during school hours without their being considered absent? Yes---------- No----------

COMMENTS:

There was 100 per cent response, which it is believed is due to an interest in the problem and the conciseness of the questionnaire. In many instances, very enthusiastic letters were received which promise cooperation in many states. However, it is plain to see that dental service for school children in America is not uniformly provided and is far from adequate.

The following is a brief analysis of the information received:

Question 1. Are school children permitted to have dental care during school hours by:

a. Private dentists

Yes	18
No	10
Optional	6

One state answered "no" and "optional" inasmuch as some localities permitted dental care by private dentists, but not legally as far as absence from school is concerned. Therefore, there was a total of 33 replies, leaving a balance of 16 states which either have no regulations or failed to reply for some other reason. We can assume then that 31 states do not permit children to leave school for private dental care.

b. School dentists

Yes	25
No	3
Optional	3

Again one state answered "no" and "optional," if considered from a legal standpoint; therefore, 30 states replied to the question, the remainder probably having no school dentistry. Eleven states answered in the affirmative to both private and school dentistry; therefore, 14 states allow absence for school dentistry but not private dentistry.

c. Health department dentists

Yes	18
No	6
Optional	5

The same state again answered both "no" and "optional," making replies from 28 states. Seventeen states permit dentistry by both school and health department clinics. Nine states permit absence for either private, school or health department care.

d. Other clinic dentists

Yes	14
No	7
Optional	3

Again one state answered "no" and "optional," leaving a total of 23 states responding to the question. Eight states allow dental care for children without absence no matter where rendered. This is a very small number when we consider the great amount of educational work that is done in the United States.

Ten states did not answer this question in any part.

Question 2. (a) If children are permitted to have dental care during school hours by private, school, health center or other clinic dentists, does the dentist verify appointment in writing?

Private dentists	20
Clinics	14
Usually	4
Optional	3
No	3

It will readily be noted that 2 more states answered this in the affirmative relative to private dentists than in the first question. This is no doubt due to the fact that absence is not legal for dental care, but when it is necessary to visit a dentist, a verification is necessary.

Thirty-one states answered the question in some part; therefore we know that some thought is given the matter.

Do dentists cooperate?

Yes	21
Usually	6

This question was answered by only 27 states. No doubt, other states have the cooperation of the dental profession, but either have no direct relationship with dentists or neglected to answer the question.

Question 2 (b). If school children are not permitted to have dental care during school hours without being considered absent, do you approve allowing absence?

Yes	15
When necessary	1
No	5

Of the 21 states which answered, 15 were in favor of allowing dental care. With this number supporting a program of preventive dentistry to start with, it will be easier for this organization to promote further approval of legal absence from school.

The foregoing questions were directly asked in the questionnaire sent, but there were so many accompanying notes and letters containing similar information that an effort has been made to record the contents under the following headings:

1. No state regulation—arrangements made by local option; 19 states voluntarily supplied this information. However, it would seem that cities and towns making local arrangements for dental service for school children would have to be guided by state school law.

2. Seven questionnaires were referred to health organizations to answer.

3. Nine states provide school dental service, in which instance children are not considered absent.

4. Five states especially stressed out-of-school appointments.

In considering information disclosed in the results of the questionnaire, a resolution is hereby proposed for adoption by the American Society for the Promotion of Dentistry for Children.

WHEREAS, Dental caries is the most prevalent disease of mankind and exists in from 85 to 95 per cent of the children in the United States, and

WHEREAS, Dental caries in children if not given proper attention has a bearing upon the general physical well-being of the child as well as his ability to progress in school, and

NATIONAL SURVEY OF DENTAL

	1. ARE SCHOOL CHILDREN PERMITTED TO HAVE DENTAL CARE DURING SCHOOL HOURS BY:												2A. IF SO, DOES THE DENTIST VERIFY APPOINTMENT IN WRITING?					DO DENTISTS COOPERATE?		2B. IF NOT, DO YOU APPROVE DENTAL CARE DURING SCHOOL HOURS WITHOUT CHILDREN BEING CONSIDERED ABSENT?		
	PRIVATE DENTIST			SCHOOL DENTIST			HEALTH DEPT. DENTIST			OTHER CLINIC DENTIST												
	YES	NO	OPTIONAL	YES	NO	OPTIONAL	YES	NO	OPTIONAL	YES	NO	OPTIONAL	PRIVATE DENTIST	CLINICS	USUALLY	OPTIONAL	NO	YES	USUALLY	YES	WHEN NECESSARY	NO
1. Alabama		x			x			x			x											x
2. Arizona			x			x			x									x				
3. Arkansas	x			x			x			x			x	x				x				
4. California		x	x		x	x		x	x		x	x			x				x			x
5. Colorado																						
6. Connecticut	x			x									x	x				x				
7. Delaware		x		x			x			x									x			x
8. Florida	x												x	x				x				
9. Georgia																						
10. Idaho	x			x			x			x			x	x				x				
11. Illinois			x	x											x			x			x	
12. Indiana		x		x			x			x						x		x				
13. Iowa																						
14. Kansas				x			x			x			x						x			
15. Kentucky	x			x			x			x			x	x				x		x		
16. Louisiana	x																x					
17. Maine		x		x			x			x			x	x				x		x		
18. Maryland	x			x			x						x					x		x		
19. Massachusetts		x		x			x				x		x	x								
20. Michigan	x			x			x			x			x	x					x	x		
21. Minnesota																						
22. Mississippi																						
23. Missouri		x		x			x				x		x	x				x		x		
24. Montana	x																x	x				
25. Nebraska																						
26. Nevada											x											x
27. New Hampshire							x			x										x		
28. New Jersey				x			x			x			x	x				x		x		
29. New Mexico	x												x							x		
30. New York	x			x			x			x					x			x				
31. North Carolina		x		x			x															
32. North Dakota																						
33. Ohio			x	x					x				x	x								
34. Oklahoma		x		x				x														
35. Oregon																				x		
36. Pennsylvania			x			x			x			x				x		x		x		
37. Rhode Island		x		x				x			x											
38. South Carolina					x			x						x				x		x		
39. South Dakota	x												x					x		x		
40. Tennessee																						

SERVICE FOR SCHOOL CHILDREN

	NO STATE REGULATION—ARRANGEMENTS MADE BY LOCAL OPTION	QUESTIONNAIRE REFERRED TO HEALTH ORGANIZATION FOR ANSWER	IF DENTAL SERVICE IS PART OF SCHOOL PROGRAM, CHILDREN NOT CONSIDERED ABS. FROM SCHOOL	SCHOOL AUTHORITIES RECOMMEND STRESSING OUT-OF-SCHOOL APPOINT'S BY PRIVATE DENTISTS	REMARKS
1. Alabama	x		x		Law allows for medical examination of children to promote health.
2. Arizona					
3. Arkansas					
4. California				x	Dental care given in some places, but not legal absence from school.
5. Colorado	x				
6. Connecticut		x			Superintendents are giving support to entire health program.
7. Delaware					
8. Florida					Dental association cares for indigents. P. T. A. arranges transportation.
9. Georgia	x				
10. Idaho					
11. Illinois	x				
12. Indiana					
13. Iowa	x		x		Larger cities employ school dentists.
14. Kansas	x				School dentists inspect. Private dentist reports cases to school dentist. Law is liberal.
15. Kentucky		x			
16. Louisiana					
17. Maine				x	
18. Maryland		x			Clinical care for indigents. Stresses medical attention.
19. Massachusetts			x		Necessary to change school law to allow private care without absence.
20. Michigan	x			x	
21. Minnesota	x				
22. Mississippi	x				No clinics. Children taken to private dentists in trucks—not regarded absent.
23. Missouri			x		
24. Montana					No clinic dentists.
25. Nebraska	x				State office has no control over this problem.
26. Nevada					
27. New Hampshire	x		x		Clinic attendance permitted without absence.
28. New Jersey	x				State interested in promotion and establishment of general standards.
29. New Mexico	x				
30. New York					Children affording private care are referred to private dentist.
31. North Carolina		x	x		State Board of Health has 17 school dentists. Arranging private care without absence.
32. North Dakota					
33. Ohio	x				State prefers leaving matter to local option.
34. Oklahoma			x		No school dentists this year.
35. Oregon					
36. Pennsylvania	x	x			
37. Rhode Island			x	x	
38. South Carolina	x				
39. South Dakota	x	x			Arrangements handled by school nurse.
40. Tennessee	x				No state law. Left to local communities to arrange.

NATIONAL SURVEY OF DENTAL

	1. ARE SCHOOL CHILDREN PERMITTED TO HAVE DENTAL CARE DURING SCHOOL HOURS BY:												2A. IF SO, DOES THE DENTIST VERIFY APPOINTMENT IN WRITING?					DO DENTISTS COOPERATE?		2B. IF NOT, DO YOU APPROVE DENTAL CARE DURING SCHOOL HOURS WITHOUT CHILDREN BEING CONSIDERED ABSENT?		
	PRIVATE DENTIST			SCHOOL DENTIST			HEALTH DEPT. DENTIST			OTHER CLINIC DENTIST												
	YES	NO	OPTIONAL	YES	NO	OPTIONAL	YES	NO	OPTIONAL	YES	NO	OPTIONAL	PRIVATE DENTIST	CLINICS	USUALLY	OPTIONAL	NO	YES	USUALLY	YES	WHEN NECESSARY	NO
41. Texas																						
42. Utah	x												x					x				
43. Vermont	x			x									x	x				x				
44. Virginia	x			x			x			x			x	x					x			
45. Washington	x			x			x			x							x		x	x		
46. Washington, D. C.				x				x			x	.	x									x
47. West Virginia	x			x			x			x			x					x		x		
48. Wisconsin			x	x					x			x			x			x		x		
49. Wyoming	x															x						
Total	18	10	6	25	3	3	18	6	5	14	7	3	20	14	4	3	3	21	6	15	1	5

WHEREAS, A great amount of the prevailing condition can be avoided if a preventive dentistry program is instituted early in life with systematic supervision, thereby reducing the liability of systemic disorders, and

WHEREAS, The dental profession is willing to do its part in providing adequate care for children, inasmuch as there is this organization, the American Society for the Promotion of Dentistry for Children expressly organized for the purpose, and

WHEREAS, The results of a national survey made relative to dental service for school children indicates that preventive dentistry is inadequate in the United States, be it

Resolved, That every member hearing this report go on record this _____ day of *August,* 1933, and do everything within his power to promote, develop, and organize a better dental service for children within his state.

Respectfully submitted,

HAZEL MERRICK, D.D.S.

REPORT OF THE COMMITTEE ON STATE UNITS

ON OCTOBER 17, 1932, our president, feeling that the society was now ready for a greater and more concerted promotion of dentistry for children than was possible with a national organization which met once a year and functioned solely through scattered committees, asked that a committee be selected to organize a unit for the promotion of dentistry for children in different states of the United States and in Canada. It was suggested that these units be constructed as much like the American Society for the Promotion of Dentistry for Children as possible and that a few units be organized in time to affiliate with this society at its Chicago meeting.

The committee was immediately selected, a plan for the formation of the state units prepared, and a constitution (which caused these units to be similar to each other and to the A. S. P. D. C.) constructed. Following this, the desirability of establishing units was investigated in Canada and in eight states of the United States.

SERVICE FOR SCHOOL CHILDREN—CONT'D

	NO STATE REGULATION—ARRANGEMENTS MADE BY LOCAL OPTION	QUESTIONNAIRE REFERRED TO HEALTH ORGANIZATION FOR ANSWER	IF DENTAL SERVICE IS PART OF SCHOOL PROGRAM, CHILDREN NOT CONSIDERED ABS. FROM SCHOOL	SCHOOL AUTHORITIES RECOMMEND STRESSING OUT-OF-SCHOOL APPOINT'S BY PRIVATE DENTISTS	REMARKS
41. Texas	x				Varies with systems throughout state.
42. Utah					
43. Vermont					
44. Virginia					Schools desirous to cooperate with private practice.
45. Washington					Wishes not to divorce dentistry from medicine.
46. Washington, D. C		x	x	x	Absence of one-half day or longer is legally absent. Excuse not prohibited.
47. West Virginia					
48. Wisconsin	x				
49. Wyoming	x				
Total	21	7	9	5	

The result of this investigation and our committee's consequent efforts are briefly tabulated as follows:

Michigan—Favorable. A group organized in May, 1932, known as the Michigan Society for the Promotion of Dentistry for Children and having seventy-two active and associate members at present, has delegated Dr. S. D. Harris to ask for its affiliation as the Michigan unit of this society.

New York—Favorable. A group organized in May, 1933, known as the New York Society for the Promotion of Dentistry for Children and having twenty-three active members at present, has delegated Dr. H. S. Dwyer to ask for its affiliation as the New York unit of this society.

California—Favorable. A group organized in 1922, known as the Bay Region Children's Dental Society and having forty active and associate members at present, has delegated Dr. C. A. Sweet to ask for its affiliation as the Northern California unit of this society.

A group organized in 1929, known as the Southern California branch of the A. S. P. D. C. and having twenty-five active and associate members at present, has delegated Dr. F. E. Hogeboom to ask for its affiliation as the Southern California unit of this society.

Georgia—Favorable. A group organized in July, 1933, as the Georgia Society for the Promotion of Dentistry for Children and having seven active members at present, has delegated Dr. F. F. Lamons to ask for its affiliation as the Georgia unit of this society.

Massachusetts—Favorable. A group informally organized in June, 1933, known as the Massachusetts Society for the Promotion of Dentistry for Children and having nine active members at present, has delegated Dr. F. Delabarre to ask for its affiliation as the Massachusetts unit of this society.

Louisiana—Favorable. A group organized in July, 1933, known as the Louisiana Society for the Promotion of Dentistry for Children and having eight active members at present, has delegated Dr. H. Weeks to ask for its affiliation as the Louisiana unit of this society.

Illinois and *Wisconsin* were unfavorable due to the press of the Century of Progress Exposition and the absence of a state dental society meeting in Wisconsin this year, and after lengthy consideration it was decided to forego the formation of societies for the promotion of dentistry for children in these states until possibly next year.

Canada was favorable, and after careful study and conference with our committee's representative in Ontario, it was decided that Canada form an independent society in order to eliminate the confusion which may otherwise arise with the difference in exchange. A copy of our constitution for state units and suggestions were accordingly mailed to their committee chairman who is at present planning this Canadian organization.

This committee thus reports that state societies for the promotion of dentistry for children have been successfully completed in six states, and the seed for a similar group has been planted in two other states and in Canada.

Respectfully submitted,

F. B. RHOBOTHAM,
G. E. MORGAN,
H. S. THOMPSON,
L. J. SCHOENY,
F. DELABARRE,
W. T. MCFALL,
C. A. SWEET,
G. WHITSON,
S. D. HARRIS, Chairman.

The affiliation of the groups which have been organized and have made application to become units of our society has been favorably acted upon by our Executive Council.

Furthermore a simple path has been laid for other states which may desire to form a state unit for the promotion of dentistry for children. The procedure is appended and a motion is made for its approval by the Society.

PROCEDURE FOR THE FORMATION OF A STATE UNIT

1. The group which is interested in forming a unit shall first gather and organize a (name of the state) Society for the Promotion of Dentistry for Children, and only temporary dues shall be established at this time. (At probably one dollar annually until January of the year following the next American Society for the Promotion of Dentistry for Children meeting, at which meeting affiliation should be completed and the dues changed accordingly.)

2. A constitution shall next be prepared as much like the model constitution (which may be procured from this committee on request) as possible (and this may be changed in minor detail before or directly following affiliation as may be suggested by the Committee on State Units).

3. Application for affiliation with the American Society for the Promotion of Dentistry for Children as a state unit (based on an active membership of at least ten dentists) may then be made by an authorized representative who has previously notified the chairman of the Committee on State Units of his intention, and, upon the approval of the Executive Council, the group making application shall become a state unit of the American Society for the Promotion of Dentistry for Children.

REPORT OF MEMBERSHIP COMMITTEE

On assuming the duties of the chairman of the Membership Committee, I realized the bigness of the job. To simplify matters, I divided the United States into five districts, and appointed a vice-chairman for each district.

District 1, Dr. E. F. Sullivan of Boston, Mass., Vice-Chairman—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, District of Columbia, New Jersey, and Delaware.

District 2, Dr. Walter C. McBride of Detroit, Mich., Vice-Chairman—Minnesota, Wisconsin, Michigan, Iowa, Indiana, Ohio.

District 3, Dr. Leo J. Schoeny, New Orleans, La., Vice-Chairman—Virginia, West Virginia, Kentucky, Tennessee, North and South Carolina, Georgia, Florida, Alabama, Mississippi, Texas, Maryland, Arkansas and Missouri.

District 4, Dr. Paul Barker, Denver, Colo., Vice-Chairman—Colorado, Oklahoma, Kansas, Nebraska, North and South Dakota, and Wyoming.

District 5, Dr. Minnie M. S. Proctor of Los Angeles, Calif., Vice-Chairman—Washington, Oregon, California, Nevada, New Mexico, Utah, Idaho, Arizona, and Montana.

The list of members for 1931— 91
The list of members for 1932—113, a gain of 22.
The list of members for 1933—151, a gain of 38.

May I thank each one of the vice-chairmen, and Dr. Hyatt, for their untiring efforts, and ask that getting new members in this organization be uppermost in the mind of each of you. Let's each one of us, for the next year, consider that he is a part of the membership committee.

Respectfully submitted,

HAIDEE WEEKS, Chairman.

PROPOSED CHANGES IN THE CONSTITUTION AND BY-LAWS OF THE AMERICAN SOCIETY FOR THE PROMOTION OF CHILDREN'S DENTISTRY

CONSTITUTION

Article II. Change "Children's Dentistry" to "Dentistry for Children."

Article III. Sec. 1. Change to read, "Active membership in this Society shall be limited to," etc.

Sec. 2. A certificate of Honorary membership may be conferred on any person who has contributed in any exceptional manner to the advancement of Child Health on recommendation of the Membership Committee and a majority vote of the members of the Society present.

Sec. 3. Associate membership shall be open to all other ethical persons in related fields interested in the advancement of Child Health. Associate members cannot vote or hold office.

Article V. Sec. 1. Change to read, "The annual dues for active membership shall be four dollars ($4.00) payable in advance. The fiscal year shall begin at the close of each annual meeting.

BY-LAWS

Article III. Sec. 2. Change to read, "The annual dues of the Society shall be four dollars, ($4.00) payable in advance. Honorary members are not subject to dues or assessments."

WALDO S. MORK, Chairman, Constitution and By-Laws Committee.

Secretary's Note:

The change in the amount of dues is suggested by the Constitution and By-Laws Committee so that, with the organization of component State Societies that has been worked out by Dr. Sam Harris and his Committee and is ready for your approval, sufficient moneys will be paid for both the component and the parent organizations to function on.

A PUBLICATION FOR THE AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN

IT WILL be herein recommended that the American Society for the Promotion of Dentistry for Children take under advisement the establishment of a regular society publication for the purpose of furthering its efforts in the promotion of dentistry for children. This recommendation is predicated on the ground that congruence and dispatch in the management of our society's efforts which have recently become more widespread can be tremendously facilitated by such a periodical and that its establishment at this time would be most opportune.

Until two years ago, official correspondence was confined largely to personal communication between officers and committees, and to occasional letters by the secretary. At that time, the secretary broadened his efforts by establishing "the monthly letter," which has come to

the members regularly, the summer months excepted, and this development has met with the hearty approval of our members and has grown rapidly.

Today, in view of our establishment of state units, the increase in our society membership, the rapid spread of our organization's efforts, and the acceleration of the movement of dentistry for children in general, the time for enlargement of this monthly letter appears to be most opportune and even necessary. Enlargement at this time of our monthly letter into a modest sized periodical conforms definitely with the Society's policy to develop each of its undertakings conservatively.

It is also of some importance to note that a large part of the annual dues has gone to defray the cost of our society correspondence, and particularly the cost of the six or seven secretary's monthly letters (of four hundred and twenty dollars spent this year, over three hundred went to defray expenses for the monthly letters). This correspondence has all been necessary and extremely worth while; and, since it must be continued and even increased with the growth of the society, some thought to its cost is pertinent.

With the establishment of a society publication this item of expense may be gradually diminished. Thus with a cost of approximately fifty dollars added to the present cost of our monthly letters, twice as many magazines (that is, three hundred magazines as compared with one hundred fifty monthly letters) can be mailed as frequently. That is six times a year.

The small cost for any additional copies that we may desire to print from time to time is, in my opinion, one of the most attractive reasons favoring the establishment of the society periodical. By this means we can ultimately contact not only (1) our own members and (2) associate members of our affiliated units but also others, for example: (3) the President, Vice-President and Secretary of the American Medical Association, the Pediatric Society, the American Dental Association and state dental societies; (4) or the editor of each national and state dental and medical publication, (5) or the dean and the faculty members responsible for dentistry for children in every dental and medical college in the United States, (6) or the dental and medical heads of national and state boards of health; and others who are especially interested. The total circulation could thus be highly selective, and its influence can later be extended to one to two thousand or more persons of key importance with very little additional cost to the organization with a very much increased opportunity for enlarging the efforts and benefits of our society.

The advantages of a periodical for the society at this time then are its opportuneness and the extreme value of enlisting others who are influential into the movement to bring dentistry for children to the position which its importance warrants with practically no additional expense to the Society. To these advantages are added the opportunities possible in a periodical of the type conceived.

The periodical will contain sixteen pages with no advertisement and the content of the periodical can be extremely useful. It lends itself to vast possibilities. It could include: (1) a short article; (2) a short editorial (of promotion rather than scientific character) frequently contributed by outstanding nonmembers of the American Society for the Promotion of Dentistry for Children, possibly the president of the American Dental Association, a dean of a dental college, the head of a large dental welfare institution for children, et cetera; (3) a question on dentistry for children (sent to the members of the A. S. P. D. C.) and a resume of the answers, compiled by a special committee or study club selected for this purpose; (4) a department of simple questions and answers on dentistry for children; (5) a barometer to indicate the progress and action of state units; and (6) another to indicate the progress of dentistry for children in dental colleges; (7) a department of pediatrics and medicine; (8) a department of dentistry for children in public health work; (9) a department for the use of officers of the society, and for organization or personal items; and (10) a department of reviews, bringing the reader a list of the current articles and the books published on dentistry for children.

The character of the publication should conform to that of the society and its policy should be similar, particularly in the matter of avoiding infringement of the efforts of other publications and in its aim to cooperate with, assist and encourage the publication in these other magazines of material intended to assist in the promotion of dentistry for children. The good in other periodicals ought to be prominently noticed.

The publication finally approved by this organization should rank with professional magazines of the highest character in quality, arrangement, editing and content, and its principles and ethics of dental journalism should be as sincere and unselfish as those of the society itself.

In harmony with these suggestions, a sample publication has been prepared and has been presented to members of the Executive Council for examination.

Respectfully submitted,

SAMUEL D. HARRIS.

It is respectfully suggested and moved that if this plan is generally acceptable, a committee be appointed to investigate its possibilities, and if the plan meets with their approval and no liability shall be assumed by this society or its members, that this committee is hereby authorized to proceed with the publication of the *Review*, but its first issue shall not be later than January 1, 1934; and it is further understood that this committee, if it assumes the publication, will assume full responsibility for all financial expenditures over and above the five hundred dollars contributed by this society.

REPORT OF NOMINATING COMMITTEE

The Nominating Committee presents the following report:
President-Elect, Dr. Charles A. Sweet, Oakland, Calif.
Secretary-Treasurer, Dr. Walter T. McFall, Macon, Ga.
Member Board of Censors for three years: Dr. Thaddeus P. Hyatt, New York, N. Y.

J. C. BRAUER,
E. M. QUINBY,
JOHN E. GURLEY,
CELIA RICH,
THEODORE O. PETERSON, Chairman.

MINUTES OF THE SEVENTH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN

MONDAY MORNING SESSION

August 7, 1933

The opening business session of the Seventh Annual Meeting of the American Society for the Promotion of Dentistry for Children, held at the Stevens Hotel, Chicago, Illinois, August 7, 1933, was called to order at 9:25 o'clock by Dr. Thaddeus P. Hyatt, President.

President Hyatt.—The meeting will come to order.

Dr. Floyde E. Hogeboom (Los Angeles, Calif.).—I move that the program be the official program of the meeting.

. . . The motion was regularly seconded, put to a vote and carried. . . .

Before asking the Secretary to read the minutes of the last meeting, I should like to express my feelings in regard to the cooperation your President has received during the past year—I know of no better guarantee for the success of any organization than to find any and every member willing to accept any work placed on his shoulders. While I have expressed my appreciation of the cooperation of those serving on committees I desire at this time to publicly express them so that all members not able to be here with us today may know of this in our published reports.

The President then asked his secretary to read the minutes of the last meeting.

. . . Acting Secretary Harris read the minutes of the Sixth Annual Meeting. . . .

Secretary's report was read and accepted.

Treasurer's report was read and accepted.

President Hyatt.—I do not see Dr. Dwyer present to give the report of the Committee on Arrangements. The program has been distributed.

Dr. W. T. McFall (Macon, Ga.).—I have a copy, if it is of any information to you.

President Hyatt.—Will you read the report for Dr. Dwyer?

Dr. McFall.—The program for this meeting is, nine to twelve, business meeting and election of officers. From 12 to 2 P.M., luncheon, with no speech over ten minutes. 2 to 4 P.M., discussion clinics.

The clinics for the meeting are:

Dr. Walter T. McFall, Macon, Georgia, will demonstrate prophylaxis, home care, cavity sterilization, anodynes, and painless extraction.

Dr. Leonard Kohn of Brooklyn will demonstrate root canal problems, space retention, and casting overlays.

Dr. Gustav Tassman of Philadelphia, pediadontics.

Dr. Floyde Hogeboom of Los Angeles, some practical problems.

These clinics will begin promptly at 2 P.M., immediately following the luncheon, and are expected to fill the afternoon. They will be illustrated by the use of the opaque belopticon furnished through the courtesy of Bausch and Lomb. At the close of the formal discussion, members may meet with the clinicians at tables provided for that purpose to take up any particular problems. Each clinician will be allowed forty-five minutes.

That is signed by H. Shirley Dwyer, Chairman of the Program and Arrangements Committee.

President Hyatt.—I shall ask Dr. McFall to speak for the Committee on Publications.

. . . Dr. W. T. McFall read the report of the Committee on Publications. . . .

In calling for the next report the President stated: In some parts of the country a great deal of difficulty is experienced in having children excused from public schools to receive dental health service, or any kind of health service whatsoever. This question was

raised, and feeling that the person who raised it must be interested, I asked Dr. Hazel Merrick of the Los Angeles Department of Health, if she would take this matter up and ascertain from different parts of the United States what the actual conditions are.

Dr. Merrick is not able to be present, but Dr. Hogeboom has kindly consented to present that report, and gave me the privilege of reading it. I was very much impressed with the tremendous amount of work that has been done practically all over the United States. So I took the liberty of sending Dr. Merrick a telegram congratulating her on the work and thanking her for her cooperation in our efforts.

I shall now call on Dr. Hogeboom to present that report.

Dr. Hogeboom.—If you will permit me, I shall read this letter she sent me first.

. . . Dr. Hogeboom read the letter received from Dr. Merrick. . . .

Dr. Hogeboom.—I wish to make this little prelude. Dr. Merrick is one of the most enthusiastic women dentists in the country, and she is accomplishing good results. I tried to urge the young lady to come, but she felt she could not and asked me to read this.

. . . Dr. Hogeboom read the Report on National Survey of Dental Service for School Children, prepared by Dr. Hazel Merrick. . . .

Dr. Hogeboom.—I am going to suggest that the report be accepted, and that this resolution be referred to the Resolutions Committee for further study before acceptance by the body at large.

President Hyatt.—Before calling on the chairman of the next special committee, I should like to read something I received from Queensland, Australia, because it has a bearing on the report I am going to call for after reading the letter to you.

The dental profession, unlike the medical, has not up until now realized or felt the need of statistical information. When life insurance companies were established, it was absolutely necessary for them to gather statistics to be able to form a basis for their premiums so as to be able to meet the obligation of the mortality of their policy holders. Therefore, there grew up a very fine statistical bureau and information was secured regarding different illnesses that had a higher or lower mortality table. It is only recently that we have commenced to realize that if we are going to meet the problem of preventive dentistry it is essential that we have reliable data.

We have not only to standardize our procedure for making the examination, but to standardize our records and charts for the securing of that information.

We are interested in preventive dentistry, and you have probably heard the term "prophylactical odontotomy," which simply means to cut the tooth for the prevention of decay.

Mr. Haenke, chief dental inspector of schools of Queensland, Australia, some four years ago became convinced that the statistics published in America regarding dental defects were worthy of study, and after investigating the subject became convinced that the best preventive for school children was to take care of the dentition before the decay started. After three years he made a comparison between those who had received that care in one school, and those in another school who had not received that care, and this report was published in the *Australian Dental Journal.*

Last June I received the following letter: "During the past year or so financial stringency has caused us here in Queensland a deal of concern regarding our work. On several occasions it would appear we would be compelled, for financial reasons, to impose considerable restrictions in the application of our system of school dental service. What this would have meant to one who has his heart and soul in that movement you will readily understand.

"The result spoke in our favor, however, and I am pleased to say that while other services suffered drastic curtailment we remained intact. This surely was a triumph for prophylactic odontotomy."

The next report is to try to aid us in securing this data which will enable us to plan our work, and also establish us on a scientific basis. I feel that the report we are about to hear is one of the most important, and will influence our future procedure, and Dr.

Rhobotham, of Northwestern University, very kindly consented to undertake this rather difficult piece of work. I now call on Dr. Rhobotham to present his report on a standardized chart.

Dr. Hogeboom.—In regard to what Dr. Hyatt has just said about Australia, I wish to interpolate that we have a young man, Dr. Terrill, in Pasadena, who was invited by the Australian Dental Society to go over there and give a course in prosthetics. They sent him a check to take a vacation and go there and teach Australian dentists prosthetics.

We have mentioned here a man interested in children's work. From all I can find out, those men are extremely well acquainted with the literature published in this country. It seems to me it would be a very profitable thing for this Society to contact the man he mentioned, and those others who are interested in children's dentistry, and see if they would not be anxious to secure some articles, some of our reports, and things of that nature, and possibly establish a nucleus over there in connection with this Society. They are extremely well acquainted with our literature, and I merely make that as a suggestion. Since he has mentioned that name, it might be a good thing for Dr. McFall, or somebody, to contact them on that.

. . . Dr. F. B. Rhobotham read the report of the Committee on Standardization of Dental Examination Charts. . . .

Dr. Rhobotham.—As the written report showed, there were three things that were recommended by the committee who studied standardization of charts, in which they recommended that something be recorded as to who made the examination, the purpose of the examination, and the type of examination. I mentioned in the report that those would be included, but I should like to suggest some other things as well.

We begin with the name and check whether male or female, the date of examination, and the date of birth.

This I consider as important as any one of these three things, the history given by whom, by the parent, by the child, or by the nurse. That is an important classification.

As to the individual who makes the examination, is it a dentist, a hygienist, a dental student, a physician, a nurse, or a teacher.

Next, the purpose of the examination. Is it for research, private practice, hospital, school clinics, detached clinics, or survey? This is not quite so important as some other facts, and yet it has a bearing because I think we then know that the report may be shaded somewhat by the purpose, whether done in a private office, whether for survey purposes, or however.

This, I think, of course, is the most important of all. This was largely suggested by Dr. Alfred Walker in that report, with one addition which I have made here. The type of examination: (1) tongue depressor only; (2) sharp explorer and mirror only; (3) same as (2) plus dry teeth and illumination; (4) same as (3) plus special microscopic light (that is the one where one can look into the pits and fissures and see how far one can go); (5) same as (4) plus x-ray pictures; (6) a check here means prophylaxis precedes examination, which has a bearing on the type of examination one gets.

If we take into consideration these four things, we have something on which to base our opinions, and the report that is taken from such a chart will make a difference as to the influence.

The next thing is the nativity of the father and the mother. Race: white, black, yellow, red, or brown.

Progress at school, satisfactory or retarded; school grade. If data are to be taken from the chart in regard to what the children in the sixth grade, the fourth grade, or the fifth grade have to report, the cards marking that particular grade would be selected.

Before I go further, may I suggest that the reason for these squares, as you find them throughout this entire record, is for the purpose of fast tabulation. If the examination is made and the check is here, here, there, and there, and so forth, a punch may be made through that check when the records are being compiled. They can then be placed in a machine, and the machine can tally it very rapidly. All of these facts can be taken off by a machine.

Here you see I have made an arrangement for the purpose of totaling findings here, so that those totals can be taken off likewise, which expedites summaries.

Attention by dentist, regular, occasional, or none, as that is related to your client.

Physical condition of the child, good, fair, or poor, and space for special cases.

Oral hygiene, is it good, fair, or poor?

Diet instruction. Are children on carbohydrate free diet, or whatever it happens to be, or do they have any diet instruction whatever? Those may have to be enlarged as far as space is concerned.

Record of brushing. Do they brush their teeth?

Nervous history: Phlegmatic, intermediate, or nervous.

Habits. You see I list nine of them: thumb-sucking, finger-sucking, lip-biting, and so on.

Occlusion: Class I, Class II, and Class III occlusion.

I do not think there is anything much more important than this phase of the chart because, as an example, we might find a certain number of children who are thumb-suckers. Would we guess that 90 per cent of thumb-suckers had Class II occlusion, for example? We do not know much about it, because all of this data has never been collected very thoroughly over a large number of children. So that covers that point.

I leave space here for other special remarks: special cases, reaction to treatment, childhood diseases, labial frenum, height and weight chart, hereditary, nose and throat, speech, medical history, hypoplasia, and so forth. There are a lot of things that could be put on here.

This is a copy, with some little change, of the chart used at the Guggenheim Clinic in New York.

Key to degree of caries. You see we have all the surfaces of the teeth shown, even the incisal edge of the central. These are the deciduous, lettered. These are the permanent teeth, numbered above and below. If caries exists in the mesial of a maxillary first molar, as an example, and only in the enamel, it would be numbered 1; if enamel and dentin, it is numbered 2; if it involves the pulp, it is numbered 3, plus for vitality, and minus for pulp death.

Here in the space representing gum tissue are: "R" for recession of gums; "G" for gingivitis; "T.O." for traumatic occlusion; "R.F." for rarefaction; "R.R." for retained root; "I" for impaction; "M" for missing tooth; and "X" for extracted tooth.

As an example of the totals that might be taken off, if you were concerned with the incidence of caries, the number of cavities totaled would have a bearing on the incidence of caries; but if you show the number of fillings as well as the number of cavities, then you have some notion about it. The child may be examined and be found to have one cavity and ten fillings. Taking that data from the chart, you not only have the number of fillings in deciduous teeth and permanent teeth, but you have the number of cavities in deciduous and permanent teeth, and the number of infections about deciduous and permanent teeth.

This space is left for further totals. For instance, you may want to find something else, and you can make a provision for it here, and the totals there.

In drawing up this chart, it is very possible that there may be considerable criticism. Some things should be added, some things should be changed, and some of the things may be eliminated. But the process we used was to use all the facts shown on all charts, and eliminate them as to their relative importance, so that we had what we considered a minimum number of facts to be recorded.

The vision that I spoke of and did not carry on in the discussion is this: The reason I did not put it in the report was because I thought, as a matter of policy, it might be approached from some other angle to better advantage. I do not know, but we can discuss that later and perhaps determine the matter. Suppose we make a few changes in this, or accept it generally. When we do accept such a chart, or a similar chart, we could readily have a central office (I am thinking now of the A.D.A. office as an example) which could send out a request, say, to twenty-five cities in the United States selected as to their geographical location, so that from our data we could make comparison between cities, between locations in the country, the South, North, East, and West, telling them that we have pre-

pared a chart that has been accepted and asking them some time during the year to make examination of the school children of their city, or rural communities as the case might be. A million would be a very simple number. I would not doubt that six to ten million would be nearer it, but suppose one million such requests were assented to and we had a million of these printed at one time from the central office. A million of them printed at one time would not be expensive. They could then be furnished to the municipalities or communities at cost. If we only had one million reports from those who made the examination, checking these things just as they should be checked (and they are simple to check), which could be gathered within a year, we might have to make a request from the Research Fund or some other fund for tabulation of these findings.

I have no doubt but that could easily be accomplished and within a year or eighteen months at the most I can see the accumulation of standardized data of one, two, or five million charts which, when the reports were accurately taken off, would give us some definite notion of what was going on and whether our information is correct or not.

If you will study this a while, you will appreciate the fact that there is any amount of cross data that may be taken off of this chart. As an example, we teach that oral hygiene has something to do with conditions of the mouth. Check it and see what the relation is. We say that infections have something to do with the physical condition of the child. Check it and find out the relationship. We say that conditions of the mouth have something to do with their progress in school. Check it and find out whether it has or not. Any amount of such things can be taken from such a chart.

If it is standardized, and we have a large amount of data, one million or five million such reports, and the summaries are taken off by the same people in the same office, we have unity and uniformity of our report, and something that is useful from the standpoint of dental education, teaching in the schools, in the colleges, matters of survey, and even research. Of course, in some matters of research we would have to go into much further detail than this, but even as simple as this chart is there is a great deal of information of a research nature.

I should like you to reserve your criticism or remarks, if you have any, until a little later. I should like to have you look over those charts a little further, and perhaps the President might have some suggestions to make in the way of discussion.

President Hyatt.—I should like to ask, Dr. Rhobotham, is there any provision to show on what surface the finding of the caries is present?

Dr. Rhobotham.—Each surface is shown for every tooth very completely, and you mark on the surface where the filling or the caries exists, even to the type of caries. Of course you can take that total of the findings marked on this chart. This space may be reserved for that purpose, as an example. This is a reserve space. This whole space can be used for what you want to take off. It seems to me these facts are pertinent, and if you want to add something before it is accepted, put them in.

President Hyatt.—There is such a difference in the friability of the different surfaces that I think it would be very desirable to be sure we would secure that data.

Dr. Rhobotham.—I am using the word "I" all the time. I wish you would pardon me for using that so much, because this is not my work alone at all; it is the work of the committee.

We had in mind getting a minimum number of facts and a simplicity of form which could be sent to any community and a reasonably accurate record made. How many facts should be recorded is a question. I think we can go too far with that, but it seems to me we have covered some territory.

Dr. Hogeboom.—There should be mention in that diet column of the P_H of the saliva, and two or three minerals in which we are particularly interested, phosphorus and calcium. I know they would not all be able to carry that out, but there should be a place in there if they should wish to bring that out, because that is a very important thing in this day and age.

Dr. Rhobotham.—I think that is important. I think this could be changed a little to give a little more space to diet. This whole business could be moved over. We only have to

check off, so we could move this whole column over and make more room for diet; have this general diet mentioned, and specific things, and space made for those.

Dr. Hogeboom.—The point you brought out about the million cards seems to me very important. One school believes in the dietary background, and another school believes in the purely local features of it. If we are going to get these statistics, that little point should be inserted in there so that if they want to they can follow them through.

Dr. J. C. Wisan (Elizabeth, N. J.).—Is there any chance of getting rid of those terms "good, fair and poor"? My experience indicates that it is rather difficult to draw the line of good, fair, and poor in oral hygiene.

For inclusion under the heading of "Oral Hygiene," I should suggest stain-free, food accumulation, and neither stain nor food accumulation. Your "good" would refer to a mouth showing no stains and no food accumulation; for "fair" use the term "stains but no food accumulation"; and for "poor," use "food accumulation." That is merely a suggestion.

Dr. Haidee Weeks (New Orleans, La.).—I think the chart is splendid. I think the space where you have the school grade is important. Whether or not the child is a repeater, or retarded in school, and, after having the mouth cleared up, is advanced in school, makes a splendid talk to boards of education, medical societies and to the public.

Dr. Hogeboom.—Do you mean the I.Q.? Do you not think that ought to be in there, too?

Dr. Rhobotham.—I think for a generalized chart throughout the United States we would not likely be able to get it.

Dr. J. C. Brauer (Lincoln, Neb.).—I have tried to find a chart that I might use in my work at the University of Nebraska. In looking through all the available literature, I have been unable to find anything adequate, so we designed a chart which is very similar to this. There is a great deal more in your chart, and it is much more thorough. I believe it is one that can be universally used. I am very glad to see it brought forth.

I have made a study in the last two years of our chart findings taking into consideration the number of cavities at various ages, the number of fillings in each mouth at different ages, and the amount of work done by my students.

In our clinic application of an examination, we have a particular system by which one senior each day makes an examination of all incoming patients. Examination, diagnosis and prognosis should be a fundamental training required of each dental student. I allow my students to make the examination, and after they have completed it I go over the entire case. I find they miss from 40 to 50 per cent of the actual cavities in the mouth, especially the incipient interproximals, and I wonder how many cavities are really missed by those men who go out who have not had sufficient training in making accurate observations in their college work. This is a problem I should like to have considered by the college group so that a more adequate method of examination could be used in the student training.

This is a thought I borrowed from Dr. McBride relative to the prognosis of a case. I think it is only fair to the patient and fair to the operator to have a prognosis, and I am not certain whether there should be a place on the card for prognosis or not.

Dr. Rhobotham.—We have in mind, of course, an examination chart. What we want to do is to collect a large amount of data that is accurate.

I am interested in seeing this movement put forward immediately so that we have a record of a million or five million examinations. It would be nice to follow along and find out what happens after the teaching has occurred and a reexamination is made.

That is not the primary purpose of this standardized chart. The primary purpose of it is to collect a large amount of data that is accurate and available for a starting point for other research. If you get a million reports of this kind that are standardized, it will give you all sorts of notions about changing your chart and making new findings on your chart, but at least it will give you a large amount of accumulated data that we so much need for accuracy.

Dr. Brauer.—You have an excellent chart and I wish to be able to cooperate with you in our section of the country. I am certain that our city of Lincoln has a large number of men who would be happy to do everything to make such a study for you.

President Hyatt.—Before we go further, I should like to suggest the line to be followed in further discussion. We all realize the value of follow-up work, but at present we are more interested in trying to get data from a large number of cases from different parts of the country, as Dr. Rhobotham has said. If we could get one, two, or three million charts of just the one examination, we would learn something from those and would learn then what kind of follow-up work we would need. That is very important. What kind of follow-up work will be the best to secure? Then it might be necessary to modify this chart for that special purpose of follow-up work.

So I would ask you to confine your discussion strictly to the purpose of securing one, two, or three million charts with data sufficiently accurate so that the information contained or secured from those will enable us to map out our future work.

Dr. E. L. Pettibone (Cleveland, Ohio).—Might I suggest that our own members take this chart as it is and use it for a limited time to gather data, and then we would probably find the places where it might be improved.

Might I not suggest to Dr. Rhobotham that he have on the back detailed instruction as to those different things he requires. Might I not suggest that he standardize the explorer. I think it would be a simple matter for him to get some manufacturer to make an explorer which might be used uniformly.

Might I not suggest that you indicate in there whether a magnifying or plain mirror is used.

Then, as far as my committee is concerned, I should like to make this an objective for the year to come for the central office to undertake this work. Dr. Mandel has done some work, I know, in the past year on this particular question, and I should like to use the influence of my committee in furthering that work in the central office in any way that I can.

Dr. H. Shirley Dwyer (Brooklyn, N. Y.).—Mr. Chairman and Dr. Rhobotham: It is a perfectly beautiful chart, but I wonder what provision will be made for reexamination of the same individual. That is most important in order to base our follow-up to know what is taking place in that individual.

Dr. Rhobotham.—Dr. Wandel did a great deal of work with me and the committee on this, so we have his cooperation, and I want to give him credit before this group for the work he has already done with us in the committee work.

In answer to Dr. Dwyer's suggestion, I am thinking of what Dr. Hyatt said before he introduced the committee report. I was on this White House Committee, as well as some other members here, and we were embarrassed because we could not give honest, accurate data. Whether we had any follow-up system or not, if we had one million such reports and could say to the medical profession or to the educators of this country, "These examinations were made under ideal conditions, and here is what we have found," we would be in a more advantageous position.

In the report we just heard, 85 to 95 per cent of the children in the United States have caries. How sure are you whether 85 or 95 per cent of the children have caries? You do not know. There has been no way of knowing. Using the Type 5, for instance, we could then say that under the finest type of examination we found that 95 per cent of the children had caries; with the simple examination with the mirror and explorer we found 80 per cent had caries; and with only a casual examination with a tongue depressor we only found 40 per cent of the children had caries.

This record would give us a definite notion, and I am only thinking of a simple not a complicated problem of reexamination, although I think it would fit into such a program, and should. The original notion is to have a lot of honest, accurate data as a basis. We have not any such thing, and we need it.

President Hyatt.—Why will not somebody make a motion accepting this report, and include in that motion that the same committee be authorized to go ahead and get the chart printed, and add whatever they feel is necessary from the suggestions made, and through whatever means, the A. D. A., or some foundation, get these charts printed and sent out? In other words, we shall not meet again for one year. It will be a very delightful occasion to feel that this committee had not only presented its beautiful report (and I want to thank

Dr. Rhobotham, but I knew what I was doing when I appointed him chairman of that committee; I wanted something, and I got it), but it would be a fine thing to be able to come next year and get some results from such data.

Dr. McFall.—I so move, and since we have a Committee on Resolutions let us get one to help the other.

Dr. M. I. Price (Baltimore, Md.).—I think this chart should be accepted, and accepted as soon as possible. We in Baltimore have an experimental area that has just been set up by the Rockefeller Foundation. With much pull, we have obtained a dental clinic, and next year we are going to start examination just for the purpose of getting data. I know we would like to get a chart of this kind.

Dr. Hogeboom.—It seems to me Doctor Rhobotham ought to draw up the proper resolution so it can be referred to this other committee. He is better equipped to do that.

Dr. Rhobotham.—Mr. Chairman, I should like some suggestions that were made here. Did you notice that I did not include in my report any suggestion that we go ahead with it. I said at the time, for matters of policy, it might be better to handle it some other way. I like your suggestion that if you find the report acceptable, you do accept it and have the committee continue by whatever means are best to promote the end. I think the committee will take care of it all right if you give them the authority.

President Hyatt.—I would like the unanimous desire of those present to adopt this report, with the addition that we ask the committee to go ahead. I do not think we need to refer it to any Resolutions Committee just at present because we have not much time left. If that meets with your approval, all those in favor signify by saying "aye." Motion carried.

The next report I am going to call for is another very interesting report. When I had the privilege of reading it, I requested the chairman to have a slide made so as to be able to show the influence of our organization on the colleges of the United States. Dr. McDowell is Chairman of the Committee on Colleges. Will Dr. McDowell give his report now?

Dr. Hogeboom.—You made that a special order for eleven o'clock.

President Hyatt.—I shall now call on Dr. Sam Harris to read the report of the progress made in organizing state societies.

. . . Acting Secretary Harris read the report of the Committee on State Units. . . .

President Hyatt.—What is your pleasure?

. . . Motion to accept the report as read was regularly made, seconded, put to a vote and carried. . . .

Dr. Dwyer.—May I ask if official recognition will be sent to these state societies immediately?

President Hyatt.—That was accepted by the Executive Council.

Dr. Dwyer.—And official recognition will be sent?

President Hyatt.—Official recognition will be forwarded by the Secretary.

Dr. Pettibone.—Will you please read the procedure that you have there?

. . . Acting Secretary Harris read the Procedure for the Formation of a State Unit. . . .

President Hyatt.—Before I call for the next committee report, I am going to appoint the Committee on Resolutions, with the idea that if there are any resolutions they can be collected and that committee will be called upon to make that report after the last clinic this afternoon.

Dr. Strusser of New York, Dr. Pettibone of Ohio, and Dr. Wisan of New Jersey, will constitute that committee and will collect the resolutions, and present those that they think should be presented before the Society this afternoon.

The next committee I shall call on will be Dr. McDowell's committee, and I shall ask him to give you a report of the work our Society, through that very efficient committee, has been able to accomplish in the colleges. Please bear in mind that when our Society was organized six years ago there was very little taught in the colleges as a special branch of dentistry for children.

. . . Dr. A. R. McDowell read the report of the College Committee. . . .

President Hyatt.—I should like to call attention to something that very many of us overlook but which each member of our Society should always remember and take the opportunity to spread the knowledge wherever he goes, because to me it is a very significant fact that the first million dollars given to dentistry to carry on work was given for dentistry for children. For example, the Forsyth Dental Infirmary was for children, not for adults. The Rochester Dental Infirmary was for children and not for adults. The Guggenheim Clinic was for children and not for adults. And in London, Rome, Paris, and Stockholm the money was given for dentistry for children. I think that is a very significant fact, and one we should always remember.

Dr. Harry Strusser (New York City).—I move that to accept the report of the committee, and refer the resolutions to the Resolutions Committee.

President Hyatt.—If there are no objections, all those in favor will please signify by saying "aye." Motion carried.

The next report is that of the Committee on Membership, by Dr. Weeks of New Orleans.

. . . Dr. Haidee Weeks read the report of the Membership Committee. . . .

President Hyatt.—You have all heard the report. Those who are in favor of receiving it, please signify by saying "aye." Motion carried.

The next report is that of the Committee on a Tentative College Program for the Teaching of Dentistry for Children. Dr. Sullivan, of Boston.

. . . Dr. E. F. Sullivan read the report of the Committee on a Tentative College Program for the Teaching of Dentistry for Children. . . .

. . . It was moved, seconded, voted and carried that the report be accepted. . . .

President Hyatt.—The next report is from the Committee on Deciduous Teeth, by Dr. Proctor. Does anybody have that report? Is Dr. Proctor present? (Not present.)

The next report is on Diet, by Dr. Cotton. Is Dr. Cotton present? (Not present.)

Next is the report of the Committee on Constitution and By-Laws. Dr. Harris will read the report from Dr. Mork.

Acting Secretary Harris.—This report was sent out four or five weeks ago to the members.

. . . Acting Secretary Harris read the report of the Committee on Constitution and By-Laws. . . .

Acting Secretary Harris.—In view of the fact that we are going to have state units, and because of them will have to change our Constitution in many respects, it has been suggested to Dr. Weeks that a committee be selected to revise the Constitution completely. Because of that, I should recommend that Dr. Mork's report be included and referred to Dr. Weeks so that she may hand this to the committee after she selects it.

Dr. Hogeboom.—There is one point I wish to bring out there, in Section 2 under Article III. It says: "On recommendation of the Membership Committee and a majority vote of the Society." It seems to me it should be "majority vote of the Executive Committee," because you never could get a majority of the Society together.

President Hyatt.—"The majority of the Society," it should be. If you have a quorum, and a majority of the quorum, they can decide for the Society. That is parliamentary usage.

Dr. Hogeboom.—I beg your pardon, but that ought to be corrected.

President Hyatt.—A quorum can transact all business. A quorum represents the Society and can transact all business. When it says "majority of the Society," it means majority of the members present who constitute the Society. Every member of our Society wherever he may be, is represented here today.

Dr. John E. Gurley (San Francisco, Calif.).—The By-Laws should read "the majority of those present." I move that a change be made to read "the majority of those present."

Dr. Dwyer.—I second that motion.

President Hyatt.—It has been moved and seconded that the change be made according to the suggestion of Dr. Gurley. I have always considered that a quorum represents the Society.

Dr. Gurley.—A quorum does represent the Society, but a quorum is not a majority of of the members of the Society, and the By-Laws are specific.

President Hyatt.—All in favor of the change as recommended, please say "aye." Motion carried.

Dr. McFall.—As a matter of information, have we accepted all of this in toto, or is it going to be referred to the committee?

President Hyatt.—That should have been an amendment to the motion. It is moved that the entire matter be referred to the Committee on Constitution and By-Laws.

. . . The motion was regularly seconded, put to a vote and carried. . . .

President Hyatt.—The next order of business is unfinished business.

There was a matter brought up, and it is now thought that there was a misunderstanding in the Executive Council yesterday. Two of them claim the matter was laid on the table, and two of them claim the matter was to be brought up. It was a recommendation that a committee further investigate the subject.

I am going to ask the courtesy of two members of the Executive Council that Dr. Harris be given permission to present to you briefly (not read all this, because the time is getting very late) an idea he has been working on, and if you are favorably inclined toward that idea then have a committee with Dr. Harris to investigate and get the accurate details on which, and only on which, we could take action.

. . . Acting Secretary Harris read a recommendation entitled "A Publication for the American Society for the Promotion of Dentistry for Children." . . .

President Hyatt.—That would take the form of a resolution to be referred to the Committee on Resolutions.

Acting Secretary Harris.—That is a motion.

Dr. Weeks.—I second the motion.

President Hyatt.—It has been moved and seconded that this resolution be handed to the Committee on Resolutions to be presented later in the day.

Dr. Hogeboom.—Nobody likes a fellow who is always jumping up and objecting, but I must put myself on record against this proposition.

In the first place, this is a motion that was brought before the Executive Council yesterday and thoroughly debated. It was given to a committee to report back to that Executive Council, and was not to appear here.

My objections to this thing are many. In the first place, our Society cannot support that thing financially. In the second place, we are not a corporation. We are a group of individuals, and as individuals we each have an individual liability which a corporation would not have. The men in this room who have had any work at all on publications will tell you that their experience has been that you cannot publish a thing like that for $500 without getting a lot of cheap advertising, and the type of advertising you get in that is not what you would get in a good ethical journal.

This, to my mind, is no time for us to try to publish a journal, or anything like that. I will admit if we had some form of communication it would be a very fine thing. Another thing is that we already have a journal which represents the Society, and Dr. McFall, the editor, has been doing a wonderful piece of work.

I simply want to put myself on record. I will not allow my name to endorse that sort of thing under the present situation as we are now organized and with the liability background of the thing, because just as soon as anything happened and the advertisers did not like the way we were doing, we would get socked a nice lawsuit. Dr. Gurley and some of these other men who have had some experience in that sort of thing know what that costs. I was one of the men opposed to that yesterday, and I get up and say the same thing now.

President Hyatt.—I would like to make a correction. There was only one person of the Executive Council who thought the idea was tabled. The other three thought it was to be presented before our Society. I want you all to realize part of what has already been remarked, that the question is simply to be brought before the Committee on Resolutions. If you will remember how the resolution read, the Committee on Publications will assume (and that can very easily be legally done) all responsibility over and above $500. It is only a

question of whether we would be willing to allow that Publications Committee to call on our treasury for any sum up to, but not exceeding, $500.

Dr. Dwyer.—That matter was presented to you, and you were present in New York before it was presented here, and our advice from New York was to forget it. That was the advice of Dr. Mork and myself, at the suggestion of Mr. Harris, that it had been a rather sad experience in New York, and that this was rather a bankrupt proposition, and we were not in favor of it in any way. I still stand against it.

Dr. McFall has done a beautiful piece of work for us, and I do not see why some arrangement could not be made with the publication rather than starting a new one when we have no visible means of guaranteeing the money. I should like to know who the asinine committee would be that would underwrite a publication of that sort.

President Hyatt.—The older I grow, the more easily I realize the inaccuracy of human testimony. I was present at the meeting Dr. Dwyer has referred to, and I wrote down at the time and asked each man to read what I had written, which was that we would be willing to contribute $500 but it should not go beyond the sum of $500. There was nothing written down that we should forget it. There was a good deal of discussion as to the practicability of it. We questioned the practicability, but we felt that was up to the committee who should take the responsibility of the publication. We were in favor of having the Society be willing to appropritae not more than $500. I wrote that down at the time, and I have it upstairs.

Dr. Dwyer.—Point of correction. We said, "Yes, but it was most untimely." You evidently forgot to write that down.

Dr. Walter C. McBride (Detroit, Mich.).—I wish to speak only of the financial side of this. I am quite familiar with that, and some of the remarks made here are just not in tune with the financial aspect of dental publishing. I have published a small bulletin in Detroit for three or four years and I am about ready to begin publishing the *Detroit Dental Bulletin.* I am therefore slightly familiar with the financial aspects of publications.

We find (and I have the data for the publication of this book which I procured for Dr. Harris) that we can put 300 of these copies in the mail for $372, six issues a year, one every second month. Five hundred of these can go in the mail for approximately $53 more, or $435.60, six copies per year. That is the financial aspect of it.

This magazine will not carry any advertising. There is to be no advertising in it as the set-up is arranged. It is purely a review of our work, with the inclusion as well of a few scientific articles. If five hundred dollars is forthcoming from the Society, it shall not be completely spent. In keeping with the expense of the Secretary each year, this is a very commendable idea.

President Hyatt.—I should like to give you another piece of information. I do not know how many of you are familiar with a little magazine called *Reader's Digest.* It is an excellent magazine. It does not give the whole article.

I had a talk with Dr. McFall yesterday afternoon, and I was telling him about this little magazine. He realized at that time (Dr. McFall knows me so well) that I would not be in favor of anything that would jeopardize the splendid work Dr. McFall has done, is doing, and can do. This little bulletin was not intended to publish all of these reports that have been given here today, valuable as they are, but it was to be a digest of the activities of our profession along the line that we have selected as our greatest interest, dentistry for children. The idea was to have more copies than merely necessary for our members, to be able to send them out to other people who might become more interested and more aroused and more active in the work for child health.

This is not a competitor or a substitute in any way. Rather, it will call to the attention of people, who may not get the journal of which Dr. McFall is editor, these excellent articles Dr. McFall is publishing. It will call attention to the excellent editorials I know he is going to write about our meetings. It is propaganda for dentistry for children.

You heard what Dr. McBride said in regard to cost, and all we are asked to do is appropriate a sum not exceeding $500, provided we get sufficient assurance legally that the committee undertaking the publication will assume all liability over and above $500.

Dr. E. F. Sullivan (Boston, Mass.).—May I ask what the membership of this organization amounts to at the present time for 1933? I believe you said it was 160.

Acting Secretary Harris.—The membership is 144.

Dr. Sullivan.—One hundred forty-four times three dollars. We have not the $3 to start with.

I believe the organization is too young to be saddled with anything quite as heavy as that at the present time, and I think if this organization would get behind Dr. McFall, we would get as much propaganda and as much advertising as we would with a separate publication.

The idea is splendid, and I think it might be possible to have the Section on Dentistry for Children, as published in the INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN, sent out as a reprint, with a supplement added by a committee appointed by this organization giving a review of the dental literature, which I presume the contents of the proposed magazine amounts to.

President Hyatt.—The question before the house is: Are you ready to refer this resolution to the Committee on Resolutions?

Acting Secretary Harris.—Dr. Hogeboom has voiced three objections to the proposed publication. The first objection is his conviction that it will cost considerably more than our present monthly letters. As has been clearly stated in the report and in the discussion already, three hundred periodicals can be issued for little more than the present cost for one hundred and fifty monthly letters. In fact our estimated cost for one hundred fifty periodicals, and the figures have been carefully checked with a number of publishers and with similar publications, is less than that for one hundred and fifty monthly letters. This is important and answers the first objection completely.

The second objection offered is the uncertainty of procuring advertisements of a desirable type. This objection is self-eliminating, for we find it unnecessary to carry advertisement of any kind. The cost presented in the report will defray every expense for the publication.

The third objection is Dr. Hogeboom's fear that if the publication is sued, the members of the society may become liable. I looked into this objection thoroughly yesterday and have the opinion of Dr. Spalding, editor of the *Journal of the American Academy of Periodontology,* that few organizations feel this objection is strong enough to consider seriously. However, the American Academy of Periodontology finds that it can procure this protection by incorporating its publication and the cost would be thirty dollars. Our society can do the same thing for a similar cost if it feels that it desires to do so.

This I believe answers Dr. Hogeboom's objections. The question before the society is simply this—do you wish a sixteen-page periodical of review in place of the customary monthly letters? In view of the fact that the publication with no advertisements will cost no more than the monthly letters, and in view of the fact that the members of the Society can be adequately protected if they desire this protection, there can be but one reasonable answer.

Dr. Dwyer.—That calls for $500. Where is the $500 coming from with our present $3 dues? You have first to vote in the $4 dues.

Dr. G. E. Morgan (Milwaukee, Wis.).—I understood you to say semimonthly and Dr. McBride said bimonthly.

Acting Secretary Harris.—The publication would be issued every other month. There would be six issues during the year. I believe that we had either six or seven issues of the monthly letter last year.

Acting Secretary Harris.—Last year our dues totaled more than four hundred dollars. Of this amount about two thirds, over three hundred dollars, went to defray the expenses of the monthly letters. For an estimated cost of $75 more than we actually spent last year for monthly letters, we can have the proposed publication and for this small cost the publication could actually be printed and mailed to twice as many persons as received the monthly letter last year. Thus the cost of each magazine on this basis is really less than the cost of the very excellent but expensive monthly letters which we have been accustomed to receiving in the past, and the publication can in the future include this letter as one-sixteenth of its total content.

Dr. Hogeboom.—Pardon me, but I want to debate that. In the first place, in no place in the records is there authorization for that monthly letter to be sent out and the $400 be spent. That has been done because nobody raised any objection. I think it is a fine thing, and all that, but I am not so sure we need that letter.

Another thing: Dr. Harris has not been secretary for the last three or four years. Dr. Charles Sweet has. We do not know who is going to be secretary next year. We do not know that it is necessary to spend as much money for that. We do not know how many letters he is going to send out. You cannot eliminate the letters from a secretary's office.

In the House of Delegates the other day, Mr. Claridge's report was that the cost of paper has gone up under the new administration's plans. It will cost them more than $300 more a month for paper alone. The figures they have in Detroit are obsolete at this minute, absolutely, because of the changed conditions under the new administration.

Acting Secretary Harris.—I can get a contract for a year at those figures, if that is satisfactory to Dr. Hogeboom.

Dr. Hogeboom.—Anybody here who was in the House of Delegates the other day will remember it was said all those contracts were wiped out under the new administration. Can a little contract for $500 stand up when they are wiping contracts out all over the country? That is laughable on the surface. Anybody who has had any experience knows you cannot put out a thing like that for $500. It will run $2,000 before you know it.

Another thing: The need has not been shown for any review of reviews for this Society.

I am putting myself in the position that I do not subscribe to a thing that is not necessary. That is the way I put it.

President Hyatt.—I do not want to call anybody to order, but I would make the request that if anybody else wants to speak he speak to the motion, which is to refer this to the Committee on Resolutions. I do not know that the cost of paper, illustrations, or anything else, has very much to do with referring this matter to the Committee on Resolutions.

I think it would be perfectly all right, knowing the Committee on Resolutions is going to consider this, for anybody who has any objections, or any one who is in favor of it, to go to that committee. The committee can then report back to the Society, or may not report back to the Society. If they do not report back to the Society—dead!

The motion is to refer this matter to the Committee on Resolutions.

I want you to stand up. Those in favor of laying it on the table, stand up. (Six.)

Those who are not in favor of laying it on the table, stand up. (Twelve.)

Dr. Rhobotham.—May I ask a question as to the meaning of referring it to the committee? Does it mean if the matter is referred to the committee, the committee has the power to act?

President Hyatt.—The motion before the house is to refer this subject to the Committee on Resolutions. If the Committee on Resolutions does not present it this afternoon, we cannot take any action.

Dr. Rhobotham.—If it does present it this afternoon, we have a chance to vote on it when presented again?

Dr. Wisan.—I should like to ask Dr. McFall one question. Do you know offhand, Dr. McFall, what percentage of the members subscribe to the INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN, and what the cost is?

Dr. McFall.—I cannot answer. I think it is rather a small number. The cost is $7.00 a year.

Dr. Harris showed me that a moment ago for the first time. It looks good to me. The finances of it I know nothing about. I am heartily in favor of getting anything that will get the American Society for the Promotion of Dentistry for Children before the world. I am a charter member, and I have been scrapping ever since I came into the Society.

It seems to me Dr. Harris has answered the three points you have raised. I voted a moment ago to lay it on the table because it is so radically new to most of you that I think it has swept you all off your feet and got you hot-headed instead of thinking it through. Being a young fellow, and being hot-headed myself, I would like to have time to think it through.

I am heartily in favor of doing anything that will help the organization. Last year this organization flagrantly insulted our clinicians and essayists by their actions. I have letters to prove that is what clinicians and essayists thought. It was rotten handling and I do not know who was responsible for it, but I had to take the rap.

The INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN made a friendly gesture and asked for the thing. That is the only way our action has been. I do not know of any other publication that has been interested in your group and tried to get any of your stuff. We have, because it has pertained to children's work, and we still stand ready to befriend and help this organization all we can.

Dr. William R. Davis (Lansing, Mich.).—I want to raise a question. If referred to the Committee on Resolutions, I do not see how it can be acted on in this section at all. According to our work, the business session is this morning, and this completes the program. There is no further provision for a business meeting.

President Hyatt.—The Committee on Resolutions will report this afternoon.

Dr. Gurley.—I do not want to prolong the debate. I voted to lay this on the table.

I believe we should not hamper the Executive Committee in any work it wants to take in spreading news among us. I am confident that this morning we are seeing the results of Dr. Sweet's letters that have gone out. I am satisfied the $300 has not been illy spent.

My idea in regard to a journal, bulletin, or definite publication is this: We are a little young in our understanding and a little small in number. The incident expense overhanging us is very great when you get into the field of publishing anything that goes out with a degree of regularity, and I think we should go at this very advisedly.

I would rather see us take action this morning and dispose of this by referring it to the Executive Committee to use their judgment in disseminating information among us and whomever they will.

I would like to offer a substitute motion, and that is to refer the matter to the Executive Committee to use their discretion in the matter of disseminating information pertaining to dentistry for children among us and whom they will during the year to come.

Dr. Hogeboom.—I second the motion.

President Hyatt.—Does the mover of the original motion accept the substitute motion? [Accepted.] Are you ready for the question? All those in favor of the motion signify by saying "aye." Motion carried.

The next order of business is the report of the Nominating Committee.

. . . Dr. Theodore O. Peterson read the report of the Nominating Committee. . . .

Dr. Peterson.—I move that the nominations be accepted.

Dr. Dwyer.—I move that the Secretary cast the ballot.

. . . The motion was regularly seconded, put to a vote and carried. . . .

Acting Secretary Harris.—The Secretary has cast the ballot.

President Hyatt.—Is there any new business except to have lunch?

Dr. McFall.—I call your attention to the fact that some committees have not reported. There has been a lot of work on these committees, and I hope nobody's feelings get hurt. The Research Committee has not reported, and the Nomenclature Committee has not reported.

Dr. Dwyer.—Can they report this afternoon?

President Hyatt.—I have called upon them. Committee on Study Clubs has been done away with.

. . . Announcements. . . .

. . . On motion regularly made and seconded, it was voted to adjourn at twelve-ten o'clock. . . .

MONDAY AFTERNOON SESSION

August 7, 1933

The second business session convened at four-thirty o'clock, President Hyatt presiding.

President Hyatt.—As I stated this morning, there were a number of resolutions presented to our Society which were referred to the Committee on Resolutions to bring before us this afternoon. Dr. Strusser is the Chairman. Will you come forward, Dr. Strusser, and present those in whatever order you desire?

Dr. Harry Strusser (New York City).—The report of Dr. Harris, as far as the publication for the American Society for the Promotion of Dentistry for Children was concerned, was referred back to the Executive Committee by the body at large this morning, and therefore it is not within the scope of the committee to bring in resolutions on that subject.

The resolution prepared in reference to Dr. Rhobotham's report this morning on the subject "standardization of dental examination charts" was for the purpose of giving latitude to the existing committee to work with the A. D. A. in the preparation of those charts, and distributing them to the members of the A. D. A. in the various communities.

"WHEREAS, The Report of the Committee on Standardization of Examination Charts has been satisfactorily received by the American Society for the Promotion of Dentistry for Children; and

"WHEREAS, It is the consensus of the opinion of the above mentioned Society that there is a need for an immediate action to carry out the purpose of the report; therefore, be it

"*Resolved,* That the same committee take the necessary steps to comply with the concept of the report with the authority of the American Society for the Promotion of Dentistry for Children."

I ask your endorsement of this resolution.

President Hyatt.—You have heard the resolution presented to us by the Committee on Resolutions. I would like you to take action thereon. What is your pleasure?

Acting Secretary Harris.—I move that it be accepted.

Dr. Weeks.—I second the motion.

President Hyatt.—Is there any discussion? If not, are you ready for the question? All those in favor please signify by saying "aye." Motion carried.

Dr. Strusser.—The report as submitted by Dr. Hazel Merrick on the National Survey of Dental Service for School Children is highly endorsed, and resolution offered for your approval.

"WHEREAS, Dental caries is the most prevalent disease of mankind and exists in from 85 to 95 per cent of the children in the United States; and

"WHEREAS, Dental caries in children if not given proper attention has a bearing upon the general physical well-being of the child as well as his ability to progress in school; and

"WHEREAS, A great amount of the prevailing condition can be avoided if a preventive dentistry program is instituted early in life with systematic supervision, thereby reducing the liability of systemic disorders; and

"WHEREAS, The dental profession is willing to do its part in providing adequate care for children, inasmuch as there is this organization, the American Society for the Promotion of Dentistry for Children expressly organized for the purpose; and

"WHEREAS, The results of a national survey made relative to dental service for school children indicates that preventive dentistry is inadequate in the United States; be it

"*Resolved,* That every member hearing this report go on record this seventh day of August, 1933, and do everything within his power to promote, develop, and organize a better dental service for children within his state."

We move its adoption.

President Hyatt.—You have all heard the motion. Does anybody second it?

. . . The motion was regularly seconded. . . .

President Hyatt.—Is there any discussion? All those in favor signify by saying "aye." Motion carried.

Dr. Strusser.—Resolutions offered by the College Committee of the American Society read as follows:

"WHEREAS, Dentistry is primarily a health measure and since so much time and effort of the dental profession have been devoted to restorative and reparative dentistry; and

"WHEREAS, The hope of the future for better oral care lies in prevention and early care of the teeth and associated tissues; and

"WHEREAS, Children's dentistry is the logical field for preventive measures because of the age of the child and at a time when oral care is most needed and does the most good; and

"WHEREAS, Dentistry is a natural division of health service, and is coming to be recognized more and more as indispensable in any modern public health program; and

"WHEREAS, We cannot expect to educate the child to the value of systematic and periodic care of its teeth until the members of the dental profession are taught their responsibility in such matters; therefore, be it

"*Resolved,* That the dental colleges of the United States and Canada be importuned to teach children's dentistry, both clinically and didactically, as a part of the dental curriculum, and that state boards of dental examiners be asked to include questions on dentistry for children, preventive dentistry, and operative skill and knowledge in handling children; and be it further

"*Resolved,* That dental students and members of the dental profession of the United States and Canada be taught the following principles of prevention:

"1. Children's teeth should receive special attention between the ages of two and fourteen years of age.

"2. Initial defects should receive careful and prompt attention, since no cavity is to be regarded as being too small to fill.

"3. Pits, fissures, and V-shaped grooves should receive special attention in both deciduous and permanent teeth before caries starts.

"4. Guard against exposed pulps in both deciduous and permanent teeth by preventing decay through regular systematic and periodic examinations; and be it further

"*Resolved,* That since these ideas are in keeping with the best known thought and practices of the day, to ignore them constitutes a violation of professional knowledge and principles and may subject the patient to loss or impaired function; and be it further

"*Resolved,* That the members of this Society declare for the principles and practices of children's dentistry as herein above set forth, and respectfully request all members of the dental profession to adhere to and abide by these principles, and to do everything in their power to advance and disseminate to the profession and the public knowledge of all phases of children's dentistry, and in particular its relation to general health; and be it further

"*Resolved,* That a copy of these resolutions shall be displayed in the office of every member of this Society and a copy sent to the various state departments of health, to the United States Government Bureaus, state departments of education, to the deans of the dental colleges, secretaries of state dental boards, editors of dental journals and secretaries of the state and national dental organizations, to the American Association of Dental Schools, and to all health organizations and welfare workers."

We endorse these resolutions.

Another set of resolutions has been offered to the Committee, which are embodied in these aforementioned resolutions, and the Committee has seen fit to disregard them.

President Hyatt.—I would like to make one suggestion. I know you will think I am a stickler on terms, but I take exception to No. 3, "Pits, fissures, and grooves." With your permission, I would like to change that to "V-shaped grooves." It is a V-shaped groove. If you are interested, I can show you how the V-shaped grooves are very friable, and we know the pits and fissures are.

I do think whatever our Society does, it should try to have the correct nomenclature used throughout everything it publishes. So, if there is no objection, I shall change that to "V-shaped grooves." Is there any objection?

. . . The motion was regularly seconded. . . .

President Hyatt.—Is there any discussion?

Member.—I should like to hear that part reread concerning hanging this up in the office.

. . . Dr. Strusser reread the paragraph called for. . . .

President Hyatt.—Are you ready for the question? All those in favor please signify by saying "aye." Motion carried.

We have drawn to the conclusion of what I consider a very successful meeting.

I wish to thank one and all who are present, and those who are absent, who have so loyally supported the administration during the past year.

Now it is my very great pleasure to introduce to you our new President, Dr. Haidee Weeks.

. . . President Weeks took the chair. . . .

President Weeks.—As I said at noon, I am delighted to be your President, and I am asking for cooperation and am expecting it, just as you have given Dr. Hyatt. I know I am not going to be the leader Dr. Hyatt was, because I am more of a boss. One thing I am going to ask you first, is to be on time, because we waste other people's time more by being late than by doing anything else.

Is there any further business to come before the meeting?

Dr. McFall, will you please come up and be inducted into office? I expect you to write all the letters possible.

We have a new member of our Executive Board whom we do not seem to be able to get along very well without, Dr. Hyatt.

Is there any further business to come before us? If there is not, a motion is in order to adjourn. I want the Executive Board to remain here for a few minutes, Dr. Hyatt, Dr. Risser, Dr. Sullivan, and Dr. McFall.

. . . On motion regularly made and seconded, it was voted to adjourn at four fifty-five o'clock. . . .

ABSTRACTS OF
CURRENT LITERATURE

NUTRITION AND PEDIATRICS

By Samuel Adams Cohen, M.D., New York City

It is the purpose of this Journal to review so far as possible the most important literature as it appears in English and foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Relation of the Suprarenal Glands to Resistance. David Perla and Jessie Marmorston. Arch. Path. **16**: 3, 1933.

These authors state that from morphologic and physiologic studies there is a great deal of evidence to indicate that the suprarenal glands play a significant rôle in the defensive mechanism of the body particularly against intoxication and infectious diseases. They and other investigators are fairly convinced from their animal experimentation that the suprarenal cortex is concerned indirectly with the neutralization of toxins. They have observed in animal experimentation that after suprarenalectomy there is a disturbance in the antibody-forming mechanism of the tissues.

Clinically it is important to note that the rôle of suprarenal glands appears to be intimately connected with the maintenance of water balance—hence in the formation of antibodies. This observation is a highly important one, particularly in the interpretation of certain phenomena which occur in acute infections. In many acute infections and often in burns, the suprarenal glands are severely injured and their function is therefore corrected to some extent by the oral or subcutaneous administration of physiologic salt solution. In this respect it is interesting to note that empirically forcing fluids has been found beneficial to treatment of severe infections and of extreme burns of the skin.

It is an observation that following suprarenal insufficiency there is a depression in natural resistance. Animal experimentation is fairly convincing also that suprarenal glands are important in the maintenance of the natural resistance of the body to intoxications, burns, bacterial and protozoan infections. The loss is probably derived from disturbances of cortical function, and it is the opinion of investigators that the lowering of resistance is the result of an injury to all body cells. As one explanation for this result the authors quote Marine who expressed the opinion that this injury is brought about by loss or absence of some nutritional factor normally supplied by the cortex, thus permitting cells of the body to be readily attacked by various poisons.

In addition, animal experimentation indicates that there are some fundamental relations of the cortex to general metabolism and particularly to cellular metabolism. That is to say there is undoubtedly a close relationship between cellular function and cellular oxidation.

It is generally accepted by clinicians that the influence of suprarenal glands on carbohydrate metabolism is attributed to medullary and sometimes to the cortical function. Moreover Cannon has recently emphasized the outstanding importance of suprarenal tissue in chemical regulation of body temperature. With these thoughts in mind it is fairly easy to understand why suprarenalectomized animals and patients with Addison's disease have lowered resistance to colds and are unable to withstand exposures to lower temperatures.

Bacterial Investigation of the Blood in Rheumatic Fever. Bessie R. Callow. J. Infect. Dis. **52**: 3, 1933.

In a careful investigation Callow recovered organisms from 194, or 53 per cent, of a total of 367 blood cultures from 174 patients with rheumatic fever. However, similar findings were also obtained from nonrheumatic patients.

This investigator states that the frequent *Streptococci viridans* and pleomorphic bacilli isolated from blood of rheumatic patients do not constitute evidence that these agents are responsible for the disease. As a matter of fact she found that blood cultures taken from the majority of cases of patients with infections in any part of the respiratory tract may have bacteremia.

As a result of her investigations Callow concludes that the diplostreptococci (alpha type) and pleomorphic bacilli may be recovered repeatedly from blood of patients with rheumatic fever and also in certain other diseases, mostly of the upper respiratory tract. She feels that these organisms apparently represent different stages in their life cycle. Because of these findings she again questions whether there is a specific etiologic relationship between these organisms and rheumatism.

Appendicitis in Children. Theu Wright. Am. J. Surg. **21**: 3, 1933.

According to Wright the mortality of appendicitis reaches its maximum in childhood. The importance of acute appendicitis in children is readily realized when the statement is made that the death rate resulting from this disease is on the increase. Because there is a larger amount of lymphoid tissue in childhood coupled with the fact that there is a thinness of the wall of the appendix, Wright holds that there is a greater rapidity of spread in childhood as compared with that in adults. Accordingly Wright believes that compared with adults the resistance to infection in childhood is lower, and furthermore, that there is a greater tendency to early perforation and widespread peritonitis.

This surgeon from Buffalo believes that acute and also chronic appendicitis is far more common than is generally believed. In regard to the diagnosis of chronic appendicitis he states that this clinical entity should be more frequently and more generally thought of as a possible cause of ill health in childhood.

The symptoms pointing to involvement of acute appendicitis are sometimes difficult to evaluate. At some times the gastrointestinal symptoms may be very marked, while at other times these may be very slight—if they are present at all. Occasionally both pain and fever may be insignificant. On the other hand, in some instances the virulence of infection from acute appendiceal involvement results in a toxemia which seems to be out of all proportion to local abdominal

signs. For these and other reasons this surgeon rightly urges operation in any acutely sick child in whom appendicitis is reasonably suspected and cannot be definitely excluded.

The time-worn excuses "wait until morning" or "wait to be certain" have been responsible for many a needless castastrophe.

Because appendiceal perforation is more liable to be brought on by the use of cathartics, Wright re-echoes an important note of warning in the danger of giving catharsis in the presence of abdominal pain.

Chorea: A Short Study of 200 Cases. H. L. Wallace. Edinburgh M. J. **40**: 9, 1933.

Writing from the Statistical Research Department of the Royal Infirmary, Edinburgh, Wallace publishes his statistical findings of 200 cases of chorea admitted to the wards for the past ten years. The average age of the females was 13.4 years; the average age of the males was 11.7 years. The ratio of males to females was 2.7 to 1. This ratio is in accord with the general agreement of other observers.

There was a definite family history of rheumatism in 18.7 per cent of this series of cases, while in the control series of families only 8 per cent had a posititve family history of rheumatism. Wallace also noted that there was a previous rheumatic history in 45.6 per cent of the cases in the series. (The abstractor is unable to compare these figures with those of other observers because Wallace includes "tonsillitis" as one of the manifestations of rheumatism.)

This clinician noted that 18 per cent of his patients had had at least one previous attack of chorea; this is a rather low percentage when compared with similar statistics of other investigators.

In regard to the etiologic factor other than rheumatism as the causation of chorea, Wallace notes that 7 per cent of his patients had some definite illness prior to chorea; in 26 per cent of this series there was a history of some nervous shock such as severe fright, accident and the like, which appeared to be the exciting factor to precipitate the onset of chorea. Because of the belief of some investigators that left-handedness and nervous irritability are frequently associated, Wallace tabulated the incidence of left-handedness in his series of cases. He found that left-handedness occurred in 10 per cent of his series of cases of chorea, while he noted that only 3.3 per cent of the controls were left-handed. There was some cardiac involvement in 41.5 per cent of the cases.

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EDITORIAL

A Syndicated Article

SOME orthodontists have been very much exercised over the syndicated newspaper article about straightening teeth by Dr. W. A. Evans in his column on "How to Keep Well." He has received letters from orthodontists who have expressed themselves in no uncertain terms because in the article he has given the impression that he receives a great many letters from persons whose experiences in having their children's teeth straightened have been unfortunate and unsatisfactory. A certain percentage, he says, object to the cost, and he advises them that straightening teeth is largely done to improve

the appearance; therefore it is a luxury, not a necessity, and funds cannot be supplied out of public coffers for luxuries. He points out that patients complain of pain and discomfort in the treatment as well as of the unsightly appearance of the appliances used, also of the long length of time required for treatment. One receives the impression from the article that of all the complaints regarding straightening of teeth which he receives, an outstanding number are from those who complain that the work has to be done over. They indicate that the teeth are straightened in childhood, and a few years later the result is found defective, and the whole gesture has to be repeated during adolescence. Further illuminating is the statement that the teeth are pulled and pushed into line and held there; and if this is done very early, perhaps during the fifth year, the jaws tend to develop more and are better shaped. Orthodontists will also be interested in the author's statement that some operators object to beginning treatment before the patient is thirteen years old because if it is begun earlier it will be necessary to do the work all over again, when the child is older. It is pointed out that if the operator waits until after the thirteenth year, he can form a better opinion as to where the teeth should be placed and enough time still remains to get such development of the jaws as the teeth themselves can supply.

Although the foregoing is not a literal reproduction of the article, the theme running through the discussion reflects the picture so often seen of a man trying to write about a scientific subject of which he knows very little, and on which he has plainly made very little effort to inform himself. The syndicated article, which appeared in the daily newspapers, contains so little that is true and so much that is untrue that it has considerable interest for orthodontists. The amazing thing, apparently, is that it is possible for a science which has made such spectacularly rapid and satisfactory strides during the last ten years, to have made unfavorable, to say the least, impressions upon the mind of a writer whose general information should be reasonably basically true. Of course malocclusions have been treated at times, even by highly competent and skillful persons, and subsequent to the treatment relapses have occurred. Nevertheless, the batting average of successes as offset by failures by this individual, would undoubtedly be a great deal higher than the averages of successes in most departments of the healing art. A great deal of malocclusion, it is known, is being treated by incompetent persons; that is, by persons who have not been thoroughly trained in the correction of malocclusion. However, it is to be remembered that there are a few incompetents in surgery, in rhinology, in pediatrics, and in every other science. It is true that the science and practice of orthodontia is suffering "growing pains" of a condition perhaps not quite so manifest in other departments of the profession. One state has seen fit, for instance, to legislate and create a statute limiting the practice of orthodontia only to those who by examination have proved themselves competent to the state examiners. This is because members of the dental profession are licensed, for the most part, by the commonwealth to practice orthodontia, while at the same time the schools from which they have been graduated have, in most instances, made no claims to teach proficiency in orthodontia. Within the specialty it has for years been

generally regarded as a highly specialized department of dentistry which should be practiced only by those whose extensive postgraduate work or whose experience enables them to become reasonably proficient in the art. Some of the most outstanding satisfactory and highly scientific work which has ever been accomplished in the entire field of dentistry has been done in orthodontia. This work, as a matter of fact, in the hands of several hundred highly trained specialists, has an almost spectacularly creditable record. Its leaders have been idealists, and a tremendous amount of research effort and of expense has been arrayed and allied with its advance. It would appear that authors of articles to appear in the public press, when approaching a field in which they know practically nothing, would, purely as a matter of caution and prudence, if not for the general public welfare, seek out official and authentic sources of knowledge in order that they might be more reasonably fair in their appraisal of a scientific calling. Lay writers would be as much justified at this time in spreading information to the public that there is no relief of diabetes because the author was not familiar with the work of Banning and McLoud, or in saying that the scourge of yellow fever is as dangerous as it was before Gorgas, as to create the impression that orthodontia is not a highly satisfactory and commendable service for children. It is true, nevertheless, that the world of science goes forward just the same, and if the above mentioned writer is ever so unfortunate as to have a child with crooked teeth in his family, he will no doubt go to the most skillful orthodontist he can find and ask him to straighten the child's teeth.

The following are facts:

Orthodontic service properly administered is *not* painful.

Orthodontic service properly administered does *not* decay teeth.

Orthodontic service properly administered does *not* use unsightly appliances.

The preferable age for orthodontic service is usually not advocated to be thirteen years, but usually between the ages of eight and twelve years.

Orthodontic service must extend over a period of months because it is a growing process, and growth does not take place suddenly.

H. C. P.

NEWS AND NOTES

Thomas P. Hinman Midwinter Clinic

The annual meeting of the Thomas P. Hinman Midwinter Clinic will be held Monday and Tuesday, March 12 and 13, 1934, at the Biltmore Hotel, Atlanta, Ga.

Jos. D. Osborne, Secretary,
604 Doctors' Building,
Atlanta, Ga.

Colorado State Board of Dental Examiners

A meeting of the Colorado State Board of Dental Examiners will be held at Denver, December 12.

N. C. Gunter, Secretary,
610 Thatcher Building,
Pueblo, Colorado.

Fisher's Orthodontic Directory

Fisher's Orthodontic Directory will be published in January, 1934. All changes of addresses should be sent to the editor, and new members who are eligible to have their names listed should communicate immediately with

Claude R. Wood, Editor,
Medical Arts Building,
Knoxville, Tenn.

Announcement

This department of the Journal will be glad to receive at any time announcements regarding change of location of offices, or other formal announcements pertaining to the practice of orthodontia or dentistry for children.

Notes of Interest

Dr. Herman H. Hoffman announces the location of his office in the Bellingham National Bank Building, Bellingham, Wash.

Dr. Brooks Juett announces the location of his office at 1112 Fayette Bank Building, Lexington, Ky.

Dr. Carl P. Cline announces the opening of his office in Suite 801 Columbia Medical Building, 1835 Eye Street, Washington, D. C. He is still maintaining his office in New York City. Practice limited to orthodontia.

Dr. J. William Maller announces the opening of an office at 5 East 53rd Street, New York City. His Bronx County office remains at 900 Grand Concourse, and he devotes alternate days at each office.

Dr. Carl B. Chase announces the removal of his office to 312 E. Wisconsin Ave., Milwaukee, Wis.

Dr. Wright J. Burley, formerly associated with the late Dr. Victor Lay in the practice of orthodontia, announces his succession to the practice. Office at 40 North Street, Buffalo, N. Y.

Dr. E. C. Lunsford announces the opening of his office at 1211 Huntington Building, Miami, Fla. Practice limited to orthodontia.

Dr. Guy B. Fairchild announces the removal of his office to 601 Medical Arts Building, Duluth, Minn. Practice limited to orthodontia.

Dr. W. J. Fitzpatrick and Dr. H. W. Cook announce the removal of their offices to Suite 1001, Olympia Building, Miami, Fla. Practice limited to orthodontia.

Dr. Irving Spenadel announces the location of his office at 262 Central Park West, New York City.

Dr. William E. Wolff announces the removal of his office to 3718 Broadway, Kansas City, Mo.